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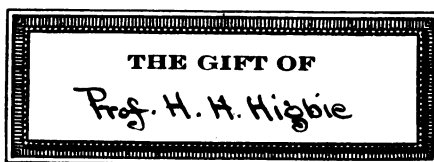
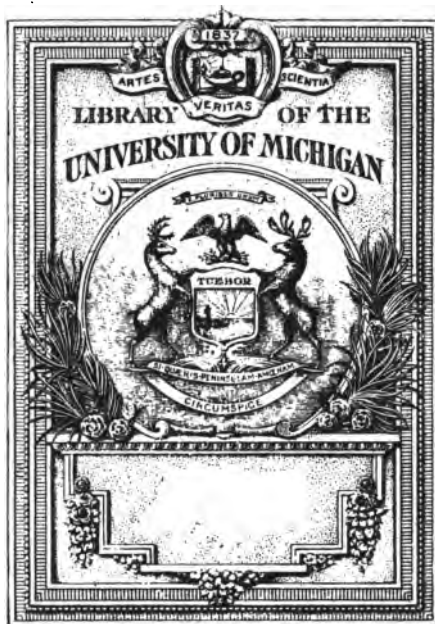
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ELECTRICAL BUREAU
—
ANNUAL REPORT
PHILADELPHIA
—
1912



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ANNUAL REPORT
OF THE
CHIEF OF THE
ELECTRICAL BUREAU

FOR THE
YEAR ENDING DECEMBER 31, 1912

ISSUED BY THE CITY OF PHILADELPHIA, 1913



PHILADELPHIA
DUNLAP PRINTING CO., 1315-29 CHERRY STREET
1913



ANNUAL REPORT
OF THE
ELECTRICAL BUREAU
FOR THE YEAR] 1912

Philadelphia, January 1, 1913.

HON. GEORGE D. PORTER,
Director, Department of Public Safety.

DEAR SIR:—I have the honor to present herewith the Annual Report of the Electrical Bureau for the year ending December 31, 1912.

The Electrical Bureau is one of the several bureaus comprising the Department of Public Safety and is charged with the following:

1. INSPECTION AND SUPERVISION.
Electrical work in and under streets.
Electrical work in City buildings.
2. COLLECTION OF LICENSE CHARGES, ETC.
Poles.
Wires.
Miscellaneous.
3. LIGHTING.
Streets, squares, alleys.
Public buildings.

4. OPERATION AND MAINTENANCE OF

Elevator system of City Hall.

Heat, light and power plant of City Hall.

Fire alarm system.

Municipal and police telephone systems.

High pressure telephone system.

Police patrol signal system.

5. SPECIAL ACTIVITIES OF BUREAU CHIEF.

Member of Highway Supervisors.

Member of Board of Examiners, elevator operators.*

Member of Board of Examiners, moving-picture operators.

Member of commission to fix price of incandescent current used in City buildings.

* Ordinance of Councils, approved April 15, 1908, provides for an Examining Board, composed of:

Chief of Electrical Bureau.

Chief of Bureau of Building Inspection.

Chief of Bureau of Steam Engine and Boiler Inspection.

For the purpose of carrying out these functions, the following force is provided:

Summary of Forces.

| Function | Specifically provided by ordinance | Number working | |
|---|------------------------------------|----------------|---------------|
| | | Dec. 31, 1911 | Dec. 31, 1912 |
| Administration, including collection of license charges, lighting of streets and public buildings ----- | 14 | 27 | 22 |
| Apprentices ----- | 10 | 5 | 2 |
| Inspection ----- | 16 | 4 | 9 |
| Elevator system ----- | 49 | 59 | 53 |
| Fire alarm system ----- | 18 | 21 | 21 |
| Telephone system ----- | 25 | 29 | 30 |
| Heat, light and power plant ----- | 38 | 57 | 44 |
| Electric light wiring (City Hall) ----- | 11 | 24 | 17 |
| Electric light wiring (other public buildings) ----- | | 21 | 13 |
| Instruments ----- | 1 | 23 | 12 |
| Police patrol, high pressure telephone, High pressure telephone City Hall signals | | | |
| Overhead construction ----- | — | 16 | 17 |
| Underground construction ----- | 4 | 72 | 49 |
| Detailled to other Bureaus ----- | — | 19 | 12 |
| Totals ----- | 186 | 377 | 301 |

The forces have been diminished to the extent of 76, by dispensing with unnecessary men, eliminating unnecessary duplication of records, etc., rearranging functions so as to lessen overlapping, improving equipment and making the hours of service correspond more nearly those of industrial concerns.

SUMMARY OF REPORT.

Financial.

| | 1911. | 1912. |
|---|--------------|--------------|
| Moneys collected for licenses and deposited with Receiver of Taxes..... | \$132,867 50 | \$142,806 85 |
| Receipts by appropriation | 1,997,808 02 | 1,952,181 88 |
| Expenditures | 1,799,276 57 | 1,733,906 73 |
| Reserve for contracts not completed.. | | 181,183 38 |
| Balances merging | | 21,788 64 |

The following shows the approximate cash savings effected in 1912 over 1911 and the cash value of additional services rendered during 1912:

| | |
|--|--------------|
| 1—Decrease in cash expenditures, as shown in the accounts of the Electrical Bureau, allowing \$10,000 to pay Keystone Telephone Company's bill for 1912, approximately | \$56,837 91 |
| 2—Decrease in expenditure for coal which will show in the accounts of the Bureau of City Property, approximately | 10,000 00 |
| 3—Cash value of additional services, rendered in 1912 by the Electrical Bureau (additional arc lighting, telephone and inspection service, etc.) approximately | 107,463 04 |
| Total gain in efficiency, approximately | \$174,300 95 |

ADMINISTRATION.

Reorganization.

The work of the Bureau is under reorganization for the purpose of concentrating the various functions in separate divisions. The Executive Offices have been rearranged to facilitate intercommunication with the least disturbance.

Planning.

Plans and specifications were made for:
 Five new passenger elevators.
 One new freight elevator.

Extensive repairs to two elevators.
 New steam-piping in the City Hall power plant.
 Telephone service for the year 1913.
 Arc-lighting of the City streets.
 Electrical work in
 Five fire stations.
 Two police stations.
 Two bathhouses.
 Two piers.
 Sewage disposal plant.

Accounting and Financial.

A new system of bookkeeping has been installed in accordance with the requirements of the Controller. Checking of bills has been simplified and the responsibility for each check affixed. Payment of men is now made on the job instead of allowing the men to lose time by coming to the Electrical Bureau offices.

Purchase and Care of Materials.

A modern system of quotation records and requisition and order blanks has been put in force, a complete inventory made and a large number of specifications drawn covering the various materials used.

Records.

Unnecessary copying has been stopped. Card files have been substituted for expensive books. Forms for permits, etc., have been revised so as to lessen the amount of pen and typewriting work.

Reports.

Daily and monthly reports are in use, showing the efficiency of operation of the Bureau, and a number of

reports upon special subjects or phases of the Bureau work have been rendered.

Supplementing these daily reports a full monthly report is made to the Director. These reports serve as a basis for the compilation of the Annual Report of the operations of the Bureau. In addition to this many special reports have been made, of which the following are among the most important:

The fire-alarm systems in Chicago, St. Louis, Indianapolis, and Cincinnati.

Electric signs, their advantages and disadvantages and the regulations or restrictions in force in different cities.

Price of arc lights in various cities.

Police patrol system in Camden, Newark, and Baltimore.

Operations of the Bureau and the economies effected during the first eleven months of 1912.

General condition of certain equipment belonging to the Bureau and the financial needs (May 10, 1912).

Condition of poles and overhead lines belonging to the City.

The Bureau has lost by death Mr. Edward Burk, manager, who has been connected with the Bureau for a period of 30 years and who had in that time acquired, by a phenomenal memory, a most complete knowledge of the systems of the equipment belonging to the Bureau. The Bureau also experienced a serious loss in the death of Secretary Clement McMahon, a man of untiring industry and marked ability. I also regret to record the death of Mr. Charles Muhlbach, one of the best of our linemen, who was killed in the performance of his duties by reason of an accidental fall from a pole.

Lighting of Streets and City Buildings.

A reduction of one cent in the price of arc lights for the year 1912 was obtained, amounting in the aggregate to about \$52,000, which is equivalent to about 600 arc lamps. A further reduction for the year 1913 was obtained, amounting to approximately \$46,000. During the year 383 additional arc lamps were authorized. In the latter part of November the transfer of the arc lamps on Market street west of the Schuylkill river from poles to the elevated railroad construction was completed and a newer type of lamp installed which greatly improved the appearance of the illumination of the street.

The price of incandescent current used in the City's buildings was reduced from six cents to five and six-tenths cents per kilowatt hour, making a saving of approximately \$1,200.

Inspection License and Permit.

A very great increase was made in the amount of inspection work performed by the Bureau over that of previous years. The work was placed under the Chief Line Inspector, and other Inspectors, who had been performing construction work, were assigned to this work.

Frequent and careful tests were made upon the arc lighting of the streets, and the systematic inspection of the City's overhead construction was made, poles were counted and their condition determined. A complete inspection of the overhead construction of all public-service corporations was also started, which, although about one-quarter completed, has revealed about 300 defective poles. Extensive tests upon electrolytic conditions, which may affect the underground cables belonging to the City, were started, several points of danger were found and the conditions remedied.

New regulations governing the suspension of electric signs have been framed and put into effect.

A complete inspection, in conjunction with the Philadelphia Board of Fire Underwriters, has been made of the 174 moving-picture shows and 43 theaters, and the owners have been compelled to remedy dangerous conditions.

The electrical work in the various buildings belonging to the City has received careful inspections to the number of 395.

Elevator System of City Hall.

Careful study was made of the relative advantages of the electric and hydraulic elevators for City Hall, and plans and specifications made and contracts awarded for five new passenger elevators, which are now being installed and which will be completed during the spring. A new sidewalk freight-lift at the northwest corner of the City Hall is also being installed, which will eliminate considerable blocking of that portion of the building by incoming freight. The remaining elevators in City Hall have undergone very extensive repairs, and for the first time in their history they have received certificates of approval from the Bureau of Elevator Inspection.

The time of operating the tower elevator has been increased one hour per day, and the number of passengers has increased from 2,161 in 1911 to 5,607 in 1912.

The number of employes required has been reduced from 59 to 52.

Heat, Light and Power Plant of City Hall.

The plans have been made and contracts awarded and work is now in progress to replace dangerous steam-piping. Work is also in progress which, when completed, will make use of the exhaust steam from the engines to heat the building, and thus effect a considerable saving in coal required.

The crank shaft of engine No. 3, which was broken in 1911, has been replaced and the generator has been rewound for 220 volts, so that it can be used to generate power for the new electric elevators.

The elevator and well pumps have received extensive repairs. A saving of 2,500 tons of coal, amounting to approximately \$10,000, was effected during the year, even though the regular office hours were extended from 3 to 5 P.M.

Fire Alarm System.

The number of street signal boxes has been increased during the year from 1,841 to 1,890, making an addition of 40 new street signal boxes.

Two additional street circuits have been split up during the year; likewise two additional fire-house circuits.

| | |
|--|--------|
| Total number of fire alarms over fire-alarm system during 1911 | 756 |
| Total number of fire alarms over fire-alarm system during 1912 | 749 |
| Total number received by telephone during 1911..... | 3,302 |
| Total number received by telephone during 1912..... | 2,893 |
| Total number of box hours out of service..... | 31,265 |
| Overhead | 25,373 |
| Underground | 5,892 |

Municipal and Police Telephone Systems.

New branch exchanges installed:

| | |
|----------------|---|
| Bell | 5 |
| Keystone | 3 |

Additional instruments:

| | |
|----------------|----|
| Bell | 45 |
| Keystone | 15 |

Outgoing calls (approximate):

| | | |
|---------------------------|-------------------------------|---------------------------------|
| Bell | 896,225 increase over 1911... | 57,839 |
| Keystone | 221,716 increase over 1911... | 14,635 |
| Total calls ... 1,117,941 | | Total increase over 1911 72,574 |

Incoming, intercommunicating and outgoing calls:

| | |
|----------------|-----------|
| Bell | 2,136,341 |
| Keystone | 831,849 |
| Total | 2,968,190 |

Calls on police section.

| | |
|--------------------|-----------|
| Bell | 1,022,168 |
| Keystone | 470,871 |
| Pawnbrokers' | 30,359 |
| Total | 1,523,398 |

In spite of the increase in work, the service afforded has been very much improved. Tests made by the Bell and Keystone special testing operators show that the average time consumed by the Electrical Bureau operators in answering calls has been diminished from 10.8 seconds in March to about 4.7 in December.

High-Pressure Telephone System.

The installation of additional instruments has proceeded along with the extension of the high-pressure water mains. A total of 58 instruments have been installed during the year, making 136 instruments now in use. The instruments have been redesigned and are now working very satisfactorily.

Police Patrol Signal System.

| | |
|---|-----|
| Street boxes, December 31, 1911 | 816 |
| Street boxes installed during 1912..... | 12 |
| Total, December 31, 1912 | 828 |
| Old booth boxes replaced, during 1912 | 6 |

A complete equipment of the latest design was installed in the new Fortieth District Station House.

Electrical Construction in City Buildings.

Electric light and power wiring has been installed in.

- 5 fire houses.
- 2 police stations.
- 2 bath houses.
- 2 piers.
- Sewage disposal plant.
- Electrical Bureau, store house.
- Crematorium.

In City Hall there have been installed:

- 16 new arc lamps on the tower.
- 4 additional arc lamps at first-floor entrances.
- 6 flaming arc lamps in the courtyard.
- 8 signs for the Receiver of Taxes.
- Exterior decorations for New Year.
- Decorations for the Mayor's Reception room.
- Lighting for the Conservation of Water Exhibit.

In addition to the above there have been in the various City buildings minor electrical jobs, either of repair, alteration or additional, amounting in number to 6,089.

Electrical signal work, consisting of bells, telautographs, etc., has been installed in over 60 rooms in City Hall, and the number of minor repairs and inspections amounts to several thousands.

Overhead Construction Work.

| | 1911. | 1912. |
|---|-------|-------|
| Total number of additional poles erected..... | | 23 |
| Poles reset or replaced | 162 | 261 |
| Poles belonging to the City | 4,487 | 4,139 |
| Miles of wire strung | 27 | 106 |
| Miles of wire taken down | 28 | 66 |
| Poles abandoned and taken down | | 343 |

For several years the work of replacing old poles has fallen behind. There should be at least 400 new poles installed every year, and unless appropriations are made

promptly, in accordance with the requests made long since, there will be undoubtedly a repetition of the fatal accident which happened during the past summer.

Not so much progress as could be wished has been made in the direction of freeing the streets from overhead wires. The following are the principal locations where wires have been taken down:

- Fifteenth street, between South Penn square and Chestnut street.
- Federal street, between Twentieth street and Twenty-eighth street.
- North side of Gray's Ferry road, between Twenty-eighth street and Thirty-sixth street.
- East side of Twentieth street, between Washington avenue and Federal street.
- South College avenue, from west side of Corinthian avenue to Poplar street; to West College avenue, to Girard avenue and to Twenty-ninth street.

The poles are increasing at the rate of nearly 2,000 per year, from which it is clear that the progress toward freeing our streets is in the wrong direction.

Underground Construction.

| | 1911. | 1912. |
|----------------------------|--------|--------|
| Duct installed, feet | 14,245 | 15,818 |
| Conductors, miles | 84 | 278 |

The policy has been to spend all the money available for underground work upon cables rather than laying much additional conduit work, as the City has miles of conduits without any cables in them.

The arc-lighting wires and lamp-posts belonging to the City have developed many troubles during the year, causing the lights to be extinguished for a considerable number of hours. Extensive replacement and repair of this property must be made, or else it must be abandoned alto-

gether, in which case a higher rate must be paid for the arc lighting.

There are some 20 public-service corporations using the City's streets for their overhead lines.

Special Activities of the Bureau Chief.

| | Examinations or meetings. No. | Candidates or applications passed upon. No. |
|--|-------------------------------------|--|
| Board of Examiners for elevator operators..... | 58 | 731 |
| Board of Examiners for moving-picture operators | 22 | 257 |
| Board of Highway Supervisors | 40 | 211 |
| Commission fixing price of incandescent current. | 3 | ... |

The financial statement of the Bureau followed by the operations of its several divisions and the recommendations are given in the succeeding pages.

Appropriations and Expenditures.

Appropriations.

| | |
|---|----------------|
| Non-merging balance, December 31, 1911..... | \$175,925 88 |
| Appropriated December 29, 1911, for the year 1912.... | 1,626,771 71 |
| Appropriated during the year 1912 | 113,488 86 |
| Total | \$1,916,186 45 |
| Transferred to Electrical Bureau during the year 1912 | 7,300 00 |
| Total | \$1,923,486 45 |
| Transferred to other bureaus | 6,487 34 |
| Total | \$1,916,999 11 |

Expenditures.

| Item. | 1911. | 1912. |
|---------------------------------------|--------------|--------------|
| 1 Salaries | \$114,745 21 | \$117,268 52 |
| 2 Repairs, labor, etc. | 62,345 56 | 84,811 77 |
| 3 Maintenance of automobile | 707 46 | 400 00 |
| 4 Postage, carfare, etc. | 5,864 12 | 4,543 06 |
| 5 Painting telegraph poles, etc. | 499 98 | 509 91 |
| 6 Telephone service* | 29,668 60 | 23,697 47 |
| 7 Hauling, labor, etc. | 55,568 52 | 32,878 94 |

| Item. | 1911. | 1912, |
|---|----------------------|----------------------|
| 8 Incandescent current City Buildings other than City Hall | 16,796 33 | 18,857 62 |
| 9 Electric lighting | 1,261,576 00 | 1,285,897 19 |
| 10 Underground construction | 59,196 19 | 6,657 14 |
| 11 Police telephone service | 5,286 00 | 5,027 98 |
| 12 Reinforcing iron posts, etc. | | 32 00 |
| 13 Improvement and extension of in- candescent electric lighting and police and fire-alarm systems | 7,681 68 | 7,353 01 |
| 14 Maintenance City Hall elevator service and dynamo-room repairs | 4,215 68 | 6,040 40 |
| 15 Wages, elevator system | 77,436 61 | 77,254 29 |
| 18 Repairs to City Hall elevators | 13,029 99 | 9,908 63 |
| 19 Electrical Equipment, South Broad Street boulevard | 5,800 14 | 11,497 57 |
| 20 Damage by storm at Tacony..... | 3,624 50 | 950 00 |
| 21 Reconstructing and replacing City Hall elevators | | 1,793 95 |
| 22 Renewal police and fire-alarm cable, Germantown Avenue | | 3,322 00 |
| 23 Electric-light service, Convention Hall | | 5,488 23 |
| 18 South Broad Street boulevard | 32,605 18 | 454 00 |
| | <hr/> \$1,756,648 85 | <hr/> \$1,704,643 73 |
| | 1911. | 1912 |
| Total expenditures | \$1,756,648 85 | \$1,704,643 73 |
| Deficiency bills, previous year..... | 16,587 01 | 888 76 |
| Expended total | <hr/> \$1,773,235 86 | <hr/> \$1,705,532 49 |
| Balance merging | 32,470 71 | 18,909 75 |
| Balance not merging | 175,925 88 | 192,556 87 |
| | <hr/> \$1,981,632 15 | <hr/> \$1,916,999 11 |

The Department of Supplies spent \$26,005.25 for supplies purchased in 1912 for the Electrical Bureau, and paid \$2,368.99 in 1912 for supplies purchased in previous years, making a total expenditure of \$28,374.24. A detailed accounting for this expenditure is made in the report of that department.

* Bill of Keystone Telephone Company, approximating \$10,000, still unpaid.

Funds Collected and Deposited with the Receiver of Taxes 1908-1912.

| | 1908 | 1909 | 1910 | 1911 | 1912 |
|---|--------------|--------------|--------------|--------------|---------------|
| License and permit charges for year (poles, wires, attachments and taxes) | \$26,746 00 | \$108,356 00 | \$107,954 50 | \$115,729 50 | \$125,239 42 |
| License charges for previous years | 52,830 00† | — | — | — | — |
| Police signal and telephone service for previous year | 50 00 | 150 00 | — | — | 150 00 |
| Police signal and telephone service for year | 2,583 33 | 2,675 00 | 2,600 00 | 2,200 00 | 2,500 00 |
| Rental of ducts in City conduits for year | 7,200 00 | 7,200 00 | 7,200 00 | 7,900 33 | 8,350 00 |
| Rental of wires in City cables for year | 2,730 00 | 7,110 00 | 5,730 00 | 5,610 09 | 4,350 00 |
| Miscellaneous | 2,220 53 | 1,831 94 | 3,711 42 | 351 46 | 1,100 91 |
| Commission on telephone calls | 375 32 | 599 45 | 557 75 | 515 71 | 616 52 |
| Philadelphia Local Telegraph Company (transmission of fire alarms and fire assignments) | — | 500 00 | 500 00 | 500 00 | 500 00 |
| Totals | \$164,735 18 | \$127,972 39 | \$123,223 67 | \$123,807 50 | \$142,806 85† |

†This represents uncollected charges of previous years collected in 1908.

†A further classification of this total follows.

Inspection and Permit Charges.

| | |
|---|--------------|
| Attachments to city poles | \$11,714 50 |
| Commission on telephone calls | 616 52 |
| Ducts, rental of, city conduits | 8,350 00 |
| Miscellaneous | 1,100 91 |
| Poles, erection | 14,320 00 |
| Poles, maintenance | 40,380 00 |
| Police signal and telephone service | 2,650 00 |
| Tax on fire-alarm boxes | 2,250 00 |
| Tax on night-watch systems | 1,152 42 |
| Tax on stock tickers | 1,405 00 |
| Transmission of fire-alarm and fire assignments | 500 00 |
| Wires on city poles | 2,560 00 |
| Wires on other poles and buildings | 51,457 50 |
| Wires, rental of, city cables | 4,350 00 |
| Total | \$142,806 85 |

The following shows the assignment of employees to the various functions by the titles of positions:

Administration.

| | |
|---------------------------------------|----|
| Chief | 1 |
| First Assistant Manager | 1 |
| Bookkeeper | 1 |
| Pay-Roll Clerk | 1 |
| Draftsman | 1 |
| Index Clerk | 1 |
| Index Clerk—Laborer | 1 |
| Stenographer and Secretary | 1 |
| Messenger and Clerk | 1 |
| Janitresses | 2 |
| Storekeeper | 1 |
| Laborers—Stenographers | 2 |
| Laborer—Order Clerk | 1 |
| Laborers—Janitors | 2 |
| Laborers—Assistant Storekeepers | 5 |
| Total | 22 |

Inspection.

| | |
|----------------------------|---|
| Chief Line Inspector | 1 |
| Inspector | 1 |
| Electrician | 1 |

| | |
|--------------------------------|---|
| Wireman | 1 |
| Permit Clerk | 1 |
| Laborers—Inspectors | 3 |
| Laborer—Inspection Clerk | 1 |
| Total | 9 |

Elevator System.

| | |
|-----------------------------------|----|
| Superintendent of Elevators | 1 |
| Elevator Starters | 5 |
| Foreman | 1 |
| Operators | 36 |
| Operators (Repairmen) | 5 |
| Laborers | 5 |
| Total | 53 |

Fire-Alarm System.

| | |
|-----------------------------------|----|
| Chief Operator | 1 |
| Inspectors | 2 |
| Test Operators | 3 |
| Fire Operators | 6 |
| Linemen | 5 |
| Batterymen | 1 |
| Laborer—Batterymen's Helper | 1 |
| Laborer—Cleaner | 1 |
| Laborer—Driver | 1 |
| Total | 21 |

Telephone System.

| | |
|--------------------------------------|----|
| Inspector | 1 |
| Supervisor | 1 |
| Operators | 20 |
| Laborer—Operator | 1 |
| Linemen | 5 |
| Laborer—Inspector's Helper | 1 |
| Laborer—Laboratory | 1 |
| Detailed from Bureau of Police | 10 |
| Total | 40 |

Heat, Light and Power Plant.

| | |
|---------------------------|---|
| Chief Engineer | 1 |
| Assistant Engineers | 3 |
| Dynamo Engineers | 3 |

| | |
|-----------------------|----|
| Dynamo-men | 3 |
| Pumpmen | 6 |
| Firemen | 20 |
| Laborer—Fireman | 1 |
| Coal Passers | 6 |
| Laborer | 1 |
| Totals | 44 |

Electric Light Wiring, City Hall.

| | |
|--|----|
| Assistant Inspector, Electric Lighting | 1 |
| Wiremen | 8 |
| Laborers—Wiremen's Helpers | 2 |
| Laborers—Arc-Light Trimmers | 3 |
| Laborers | 3 |
| Total | 17 |

Electric-Light Wiring, Other Public Buildings.

| | |
|--|----|
| Chief Inspector, Electric Lighting | 1 |
| Inspector | 1 |
| Wireman | 1 |
| Laborers—Helpers | 9 |
| Driver | 1 |
| Total | 13 |

Instruments.

Police Patrol—High Pressure Telephone—City Hall Signals.

These three functions are united into one division.

| | |
|--------------------------------|----|
| Second Assistant Manager | 1 |
| Inspectors | 4 |
| Wireman | 1 |
| Laborers | 6 |
| Total | 12 |

Overhead Construction.

| | |
|----------------|----|
| Lineman | 1 |
| Foreman | 1 |
| Climbers | 7 |
| Laborers | 6 |
| Drivers | 2 |
| Total | 17 |

Underground Construction.

| | |
|---------------------------------|----|
| Inspectors | 3 |
| Plumbers | 4 |
| Laborer—Carpenter | 1 |
| Laborer—Blacksmith | 1 |
| Bricklayer | 1 |
| Drivers | 3 |
| Laborers | 36 |
| Total | 49 |
| Detailed to other bureaus | 12 |

DETAIL OF REPORT.

ADMINISTRATION.

Early in the year a careful study was made of the administration work of the Bureau, which showed that the functions were scattered among more persons than seemed desirable. No one person other than the Chief of the Bureau had any general direction over any specific function. To correct this condition the work of the Bureau is now being reorganized and divided, and being grouped under several divisions. This reorganization, when completed, will group all functions that are similar in nature under the supervision of one man.

The Executive Offices have already been arranged so as to bring more closely together the administrative forces of each division and to provide access to each division head without necessitating the passing through of other offices with the consequent disturbances.

The entrance for those having business with the Bureau has also been made more central.

The general planning of the Bureau's work, the financial operations of the Bureau, and the accounting, purchase, care and issuance of stores are now grouped under the head of administration.

Planning.

The following principal studies and plans were made:

Reorganization of the Bureau.

Rearrangement of Executive Offices.

Five new electric passenger elevators for City Hall.

One new freight elevator for City Hall.

Repairs to police elevator No. 21.

Repairs to court elevator No. 22.

Preliminary plans and estimates for steam-electric supply feeders for the Home for the Indigent; this supply to be taken from the House of Correction.

A study of and specifications for the police patrol system from the standpoint of safety to the public and the patrolmen.

Plans and specifications for extensive high-pressure steam-piping in City Hall power plant to replace leaky and dangerous existing piping.

Plans and specifications for rearranging low-pressure steam-piping in City Hall power plant so as to make use of the exhaust steam for heating.

Specifications for the telephone service from the Bell and Keystone companies for the year 1913.

Specifications covering the arc-lighting of the City's streets.

Plans and specifications for the electrical work in the following City buildings:

Fire Stations.

Fifty-fifth and Pine streets.

Sixth street and Lehigh avenue.

Belgrade and Huntingdon streets.

Snyder avenue west of Fifteenth street.

Cheltenham avenue east of Germantown avenue.

Police Stations.

Fifty-fifth and Pine streets.

Twenty-eighth street north of Oxford street.

Bath Houses.

Summer street east of Fifty-seventh street.

Tacony street west of Levick street.

Piers.

No. 19 north.

Dock street.

Sewage Disposal Plant.

Pennypack Creek Station.

In addition a large number of specifications covering materials and supplies used by the Bureau have been prepared.

The following important contracts based upon these specifications have been awarded:

| | |
|---|----------------|
| Lighting of streets | \$1,280,628 05 |
| New electric elevators | 96,321 00 |
| High-pressure steam piping | 6,000 00 |
| Telephone service from October 15 to December 31, 1912 | 6,680 17 |
| Fire and police boxes | 5,500 00 |
| Low-pressure piping | 5,269 00 |
| Incandescent lamps | 5,000 00 |
| Underground cable | 3,300 00 |
| Repairs to elevator No. 21 | 2,470 00 |
| Lamps | 1,721 89 |
| Cable | 1,100 00 |
| Repairs to pumps | 1,460 00 |

Accounting and Financial.

A new system of accounting has been installed which is in accordance with the system of the Controller. This system shows the cost of each division of the Bureau's work, as, for example, the cost of heat, light and power plant in

City Hall, or the fire-alarm system, etc. We can also obtain the cost of each separate job, and if desired each item of a job whenever the value of such information is sufficient to warrant doing so.

The auditing of bills has been simplified and by suitable systems the responsibility for each step has been fixed and a special division made by which to apportion the amounts properly to the various accounts.

The unnecessary copying of bills has been stopped. Formerly every bill was copied into a book in longhand, although the Bureau always had three copies of each bill furnished by the vendor, one of which was actually thrown into the waste basket.

The payment of men has been simplified. Formerly the duplicate payroll was made in longhand, but now it is prepared by the process of carbon copying. Instead of attempting to pay the entire force in one day, resulting in the piling up of the men in one place and loss of labor, the men are now paid by divisions. The construction and repair men outside of City Hall who formerly came to City Hall for their money and thereby wasted a great deal of time are now paid on the job by use of an automobile at a saving of over \$100 per month.

Purchase and Care of Materials.

While it is impossible to properly and economically care for material until the Bureau is provided with an adequate storehouse, still important improvements have been made to insure against loss by theft or otherwise, and the very considerable economy of \$4,500 made by doing away with unnecessary employes in the shape of storekeepers, helpers and watchmen. A complete inventory has been made and is so arranged on cards as to constitute a perpetual inventory, on which any item can be checked up at any date.

ELECTRICAL BUREAU

DAILY REPORT

January 9-th, 1912.....

| | |
|--|---------------------------------|
| EMPLOYEES.....Late.....With Leave.....Without Leave.....Sus'p.....Vacancies..... | 0.....16.....4.....0.....4..... |
| ACCIDENTS.....0..... | COMPLAINTS.....2..... |

INSPECTION

Arc Lights No. not burning.....217.....
 " " circuit tests.....0.....
 Wiring, No.....inspections.....0.....
 Moving picture shows.....2.....
 Signs.....8.....
 Theatres.....1.....
 Underground cables.....0.....
 Wires for length, support.....1.....

PERMITS

POLES Held.....29.....
 Issued.....23.....
 SIGNS Held.....1.....
 Issued.....0.....
 UNDERGROUND Held.....0.....
 Issued.....6.....
 WIRES NEW Held.....0.....
 Issued.....35.....
 WIRES REPAIR Held.....0.....
 Issued.....0.....

FINANCIAL

Cash received.....0.....

WARRANTS ISSUED

Materials.....0.....
 Salaries.....0.....

WORK IN PROGRESS

MAINTENANCE Jobs Started.....72.....
 " Finished.....73.....
 NEW CONSTRUCTION " Started.....1.....
 " Finished.....1.....
 PLANS " Started.....3.....
 " Finished.....2.....

OPERATING PLANT

ELEVATOR Car hours out of service.....15.....
 No. of FIRE ALARMS.....2.....
 Received by system.....2.....
 Otherwise.....14.....
 BOX HOURS OUT OF SERVICE.....
 Overhead.....102.41.....
 Underground.....0.....
 STATION HOURS OUT OF SERVICE.....
 One circuit.....20.....
 Completely.....0.....
 HIGH PRESSURE BOXES.....
 Box hours out of service.....
 MUNICIPAL TELEPHONES.....
 Station hours out of service.....164.32.....
 POLICE SIGNAL BOX One circuit.....800.....
 HOURS OUT OF SERVICE Completely.....5.....
 POLICE TELEPHONE.....
 Station hours out of service.....0.....
 POWER PLANT K. W. HOURS No.....9544.48.....
 Cost of one.....
 COAL USED Tons.....68.17.....
 ASHES Tons.....15.....

REMARKS

Clayton W. Pike
 Chief.

A complete modern system of quotation blanks, price records, requisition and order blanks, which were practically lacking, has been introduced and is working smoothly. The practice of buying for a year's supply all of the materials needed by the Bureau through contract with one vendor, which has hitherto resulted in practically an entire absence of competition, has been largely done away with; instead bids upon definite quantities of each class of materials are invited from manufacturers or wholesalers of those materials, and there is now no difficulty in obtaining a large number of proposals upon most of these materials. The saving by this method has been about 25 per cent.

Records and Their Filing.

The work in this line has been both simplified and extended. It has been simplified in some cases by discontinuing the making of unnecessary copies when the Bureau already had sufficient copies. The use of card files instead of expensive books has also brought about a saving of both time and money. The forms for records such as permits, inspection reports, etc., have been revised so as to make them more uniform in size and to do away with a vast amount of typewriting and handwriting.

The work of record filing has been considerably extended by the production of records which formerly were not kept at all, or, if so, were not filed in available form.

Reports.

The practice of making daily reports to the Director of Public Safety was inaugurated July 18. This report is a brief index of the extent of the work done by or efficiency of operation of the different divisions for the preceding day.

LIGHTING OF STREETS AND CITY BUILDINGS.

The arc-lighting of the streets is carried on almost entirely by contract with the Philadelphia Electric Company, which has for some years been the only bidder. The open-arc type lamp is used, requiring 9.6 amperes, 47 volts and of a nominal 2,000-candlepower. All lamps are authorized and located by ordinance of Councils.

Dockages are made for any light which does not burn at least six hours per night from April 1 to August 31, and nine hours from September 1 to March 31. Dockages are largely based on nightly reports rendered by the police officers.

The free lamps are those furnished free of cost to the City in return for certain privileges granted by ordinance.

The negotiations with the Philadelphia Electric Company resulted in obtaining a reduction in the price per lamp per night of one cent, which is equivalent to \$3.65 per lamp per year. For the 14,032 lamps then authorized this means a total saving of \$51,238.70. The appropriation for 1912 was increased by Councils over that of 1911, and this increased amount, together with the reduction in price, enabled the City to have a much greater number of arc lights, the actual equivalent extra number being 711, shown in the following table:

| Month | 1911 | 1912 |
|---------------------|--------|--------|
| January | 13,089 | 14,038 |
| February | 13,092 | 14,038 |
| March | 13,092 | 14,038 |
| April | 13,092 | 14,038 |
| May | 13,092 | 14,038 |
| June | 13,092 | 14,038 |
| July | 13,107 | 14,038 |
| August | 13,112 | 14,058 |
| September | 13,859 | 14,058 |

| | | |
|---------------------------|---------|---------|
| October | 13,995 | 14,215 |
| November | 14,011 | 14,215 |
| December | 14,038 | 14,396 |
| | <hr/> | <hr/> |
| | 160,669 | 169,208 |
| Monthly average | 13,389 | 14,100 |

By a contract executed for the year 1913 a further saving of approximately \$46,000 has been made by reason of a still further reduction in the price per night per lamp.

The following table shows the variations in the number of lamps, their prices and the total contract price for arc-lighting for several years past. The deductions noted are those provided in the contract to cover failures to meet the exact requirements of the specifications:

Electric Lighting of City Highways, 1907-1912

| | 1907 | | 1908 | | 1909 | | 1910 | | 1911 | | 1912 | |
|---|-----------------|--|-----------------|--|-----------------|--|-----------------|--|-----------------|--|-----------------|--|
| PAYD LAMPS: | | | | | | | | | | | | |
| Contract price----- | \$1,114,224 50 | | \$1,182,791 22 | | \$1,182,791 22 | | \$1,213,716 55 | | \$1,238,923 15 | | \$1,286,287 96 | |
| Deductions for outages, etc----- | 4,882 89 | | 3,139 58 | | 1,917 52 | | 2,520 97 | | 6,543 56 | | 7,071 13 | |
| Total number of lamps in service December 31st*----- | 11,221 | | 11,817 | | 12,100 | | 12,081 | | 14,038 | | 14,396† | |
| FREE LAMPS: | | | | | | | | | | | | |
| Philadelphia Electric Company----- | 104 | | 104 | | 104 | | 104 | | 104 | | 105 | |
| Girard Estate----- | 86 | | 86 | | 86 | | 86 | | 86 | | 86 | |
| People's Traction Company----- | 3 | | 3 | | 3 | | 3 | | 3 | | 3 | |
| Number of lamps classified by circuits, authorized at the beginning of the year, and on which the contract is based. | Number of lamps | | Number of lamps | | Number of lamps | | Number of lamps | | Number of lamps | | Number of lamps | |
| | Rate per night | | Rate per night | | Rate per night | | Rate per night | | Rate per night | | Rate per night | |
| On City underground cables----- | 877 | | 883 | | 871 | | 840 | | 856 | | 776 | |
| On company's underground cables----- | 767 | | 950 | | 954 | | 1,168 | | 1,718 | | 2,238 | |
| On company's overhead cables: North of Allegheny avenue (including West Philadelphia) | 3,544 | | 3,859 | | 3,869 | | 3,900 | | 10,518 | | 11,024 | |
| South of Allegheny avenue----- | 6,033 | | 6,125 | | 6,133 | | 6,138 | | — | | — | |

*The number of authorized lamps does not necessarily correspond to the number of lamps burning, as many are not put in operation until long after they have been authorized. For this reason, the contract price, which is based on the total number authorized, will not exactly correspond with the total sum paid plus the deductions. But as the difference is quite small, the table of contract prices represents closely enough what it is intended to show, namely, the growth in the expenditures for arc lighting from 1907 to 1912, inclusive.

†883 new lamps were authorized in 1912.

*Distribution by Wards of Arc Lamps Furnished Under
Contract with the Philadelphia Electric Company.*

| Ward. | Area in sq. miles. | Population. | Arc lights. |
|----------------------|-----------------------|-------------|----------------|
| First | .700 | 47,712 | 221 |
| Second | .442 | 40,536 | 234 |
| Third | .191 | 25,747 | 201 |
| Fourth | .299 | 22,316 | 165 |
| Fifth | .321 | 17,006 | 261 |
| Sixth | .321 | 6,374 | 334 |
| Seventh | .439 | 27,425 | 318 |
| Eighth | .435 | 13,965 | 436 |
| Ninth | .400 | 5,071 | 482 |
| Tenth | .359 | 19,426 | 293 |
| Eleventh | .210 | 11,619 | 153 |
| Twelfth | .193 | 15,152 | 153 |
| Thirteenth | .259 | 19,769 | 194 |
| Fourteenth | .237 | 19,477 | 288 |
| Fifteenth | 1.049 | 47,273 | 408 |
| Sixteenth | .281 | 16,175 | 199 |
| Seventeenth | .251 | 17,484 | 186 |
| Eighteenth | .650 | 27,134 | 363 |
| Nineteenth | .698 | 52,283 | 528 |
| Twentieth | .734 | 45,356 | 498 |
| Twenty-first | 7.129 | 35,406 | 325 |
| Twenty-second | 10.741 | 70,245 | 465 |
| Twenty-third | 3.205 | 32,133 | 342 |
| Twenty-fourth | 4.150 | 54,681 | 552 |
| Twenty-fifth | 1.100 | 42,510 | 239 |
| Twenty-sixth | 1.400 | 54,842 | 370 |
| Twenty-seventh | 1.510 | 24,255 | 331 |
| Twenty-eighth | 1.024 | 49,242 | 260 |
| Twenty-ninth | .822 | 30,217 | 192 |
| Thirtieth | .519 | 29,209 | 295 |
| Thirty-first | .713 | 30,863 | 364 |
| Thirty-second | .809 | 40,293 | 377 |
| Thirty-third | 2.983 | 51,769 | 221 |
| Thirty-fourth | 4.407 | 49,575 | 464 |
| Thirty-fifth | 33.261 | 10,484 | 327 |
| Thirty-sixth | 6.081 | 61,379 | 351 |
| Thirty-seventh | .520 | 23,110 | 256 |
| Thirty-eighth | 3.990 | 48,939 | 323 |
| Thirty-ninth | 4.809 | 54,393 | 276 |
| Fortieth | 8.089 | 41,820 | 260 |

| Ward. | Area in sq. miles. | Population. | Arc lights. |
|---|-----------------------|-------------|----------------|
| Forty-first | 6.250 | 15,640 | 314 |
| Forty-second | 9.163 | 23,610 | 198 |
| Forty-third | 1.461 | 43,260 | 231 |
| Forty-fourth | 1.168 | 39,138 | 254 |
| Forty-fifth | 3.100 | 26,234 | 181 |
| Forty-sixth | 2.800 | 38,459 | 350 |
| Forty-seventh | .578 | 30,002 | 248 |
| Bridges and piers | | | 140 |
| Total lamps ^{authorized} in service , December 31, 1912 | | | 14,421 |

LIGHTING OF CITY BUILDINGS.

The incandescent lighting of City buildings and structures except City Hall, which has its own plant, is done by current taken from the Philadelphia Electric Company. A part of this current is paid for at the rate of five and six-tenths cents per kilowatt hour. The balance is furnished free as required by ordinances granting the original electric companies (now absorbed into the Philadelphia Electric Company) the privilege of erecting poles, conduits and wires through or under the city streets. The following table shows the structures for which the City buys the current by meter, the annual cost being about \$17,000.

Bath Houses:

Queen street above Third street.
 Montrose and Darien streets.
 Twelfth and Reed streets.
 Twenty-fifth and Buttonwood streets.
 732-734 Lombard street.
 Ridge avenue and Bridge street.
 Sixty-third street, north of Woodland avenue.
 Montgomery avenue and Moyer street.
 1241-1243 North Front street.

Boulevard and Bridges:

Parkway, between Nineteenth and Twenty-fourth streets.
 Walnut lane bridge.
 Forty-second street bridge.

Engine Houses:

Truck No. 1, 2132 Fairmount avenue.
 Truck No. 2, Florist street, above Third street.
 Truck No. 4, 319 Delancey street.
 Truck No. 9, 2110 Market street.
 Engine No. 1, 1837 South street.
 Engine No. 4, 1528 Sansom street.
 Engine No. 8, Second and Quarry streets.
 Engine No. 13, Parrish street, above Thirteenth street.
 Engine No. 18, Uber and Callowhill streets.
 Engine No. 20, Tenth and Commerce streets.
 Engine No. 22, 214 Pine street.
 Engine No. 26, Tenth and Buttonwood streets.
 Engine No. 32, 232 South Sixth street.
 Engine No. 43, 2110 Market street.
 Fire Boat "Stuart," Race Street Pier, Delaware river.

Police Stations:

3d Police District, 321 Delancey street.
 4th Police District, Race, above Third street.
 5th Police District, Fifteenth and Locust streets.
 6th Police District, 235 North Eleventh street.
 8th Police District, Tenth and Buttonwood streets.
 9th Police District, Twentieth and Buttonwood streets.
 19th Police District, Pine street, west of Twelfth street.
 20th Police District, Fifteenth street, below Vine street.

Pumping Stations:

Delaware avenue and Race street.
 Seventh street and Lehigh avenue.

Miscellaneous:

Race Street Pier, Delaware river.
 Chestnut Street Pier, Delaware river.
 Morgue, 1307 Wood street.
 Storehouse, 217 North Fifth street.
 Storehouse, 1517 Filbert street.
 Van Stables, Eleventh and Wharton streets.

Free current is furnished to the balance of the City structures and is not metered. Its estimated value is \$39,000.

The price of current supplied by the Philadelphia Electric Company to City structures was five and six-tenths

cents per kilowatt hour in 1912, as against six cents per kilowatt hour for the year 1911. This reduction in price represents a saving for the City of approximately \$1,200.

INSPECTIONS, LICENSES AND PERMITS.

By the ordinance of July 1, 1908, the Electrical Bureau, in addition to powers conveyed by previous ordinances, was expressly charged with the supervision of all electrical conductors in and under the City streets, and of all electrical installations in City buildings or structures. The ordinance of April 12, 1909, charges the Bureau with the inspection of all electric signs, and the ordinance of February 20, 1908, put control over moving-picture parlors and theaters in the hands of the Director of the Department of Public Safety, who delegates the inspection of the electrical work to the Electrical Bureau.

The public-service corporations make sworn returns annually of the number of poles and miles of wire erected, and take out permits for such work. Under a new rule, put in force May 1, 1912, they have been required to state the length of wire upon each application for a permit to erect wires on poles and the Bureau Inspectors check up many of these cases by actual measurement.

A very great increase has been made in the amount of inspection work performed by the Electrical Bureau during 1912 over previous years. To begin with, a separate division of inspection was established coequal in importance with other divisions and headed by the Chief Line Inspector. Other inspectors who had been formerly doing construction work instead of inspection were transferred to this division and several *per diem* men added.

Frequent tests upon the arc-lighting of streets, the largest contract executed by the City, were made; the number of such tests being approximately 40 times as great as had hitherto been the case.

A systematic inspection of the City's overhead construction was made and the poles counted, and their condition investigated. Likewise a systematic inspection of the overhead construction of all public-service corporations was started; about one-quarter of this work has been completed. This inspection has brought to light about 300 defective poles which were undoubtedly a menace to the public.

A systematic inspection and test of electrolytic conditions as affecting the City's underground cables was started and a large portion of the work completed.

Tests have been made on 64 streets to determine whether or not the City's underground cables were in danger from electrolysis. At several points City cables were found to be positive to the Rapid Transit Company's tracks, and immediately that company has taken steps to apply the proper protective measures. At Kensington avenue and Cumberland streets they have bonded the sheathing of City cables to their return, and at Amber and Cumberland streets bonded to the Bell Telephone Company's return, which has made City cables safe at those points. The Philadelphia Rapid Transit Company are now working upon the protection of the City's new Emerald street telegraph cable, which is highly positive.

The danger zones referred to are in the neighborhood of the newer sub-stations of the Philadelphia Rapid Transit Company.

Electrical Bureau Laboratory.

The Electrical Bureau Laboratory is located in Room 634, City Hall. Its equipment consists of modern and accurate electrical testing instruments, among which are the following:

A laboratory cable testing set for the measurement of insulation, capacity, and conductivity of cables.

A potentiometer for the calibration of direct current voltmeters and ammeters.

A photometer for the measurement of the candlepower and efficiency of incandescent lamps.

In addition there are a number of portable instruments, including a cable-testing set, dial decade set, two fault finders, a power bridge, and several Weston ammeters and voltmeters.

Laboratory Tests.

Insulation and Conductivity:

- 80,000 feet No. 6 arc-light cable.
- 36,000 feet 25 pr. paper cable.
- 4,000 feet 20 pr. paper cable.
- 6,000 feet 15 pr. rubber cable. (Aerial.)
- 2,000 feet 10 pr. rubber cable.
- 2,000 feet 4-conductor cable.
- Insulation tests of two short lengths of old cable.
- Insulation tests, 500 feet Habirshaw wire.
- Insulation tests, asbestos covered and braided pipe wire.
- Tests of sample of Montuck Fire Detecting Wire.

Lamp Tests:

- Twenty tests on Tungsten lamps.
- Six tests on Sterling Gem lamps.
- Absorption and reflection tests of Holophane and Alba shades at various angles.
- Five efficiency tests of arc-light globes.

Insulation Tests of:

- Three fire boxes.
- Six samples of old tape. (Formerly in service.)
- Three samples of new tape.
- Made ten ammeter calibrations.
- Made six voltmeter calibrations.

Electric Signs.

The falling of several signs, due to a severe windstorm in March, led to a study of the regulations in force concerning electrical signs and the material and methods used in erecting them. The various makers of electric signs

were called to the Bureau to discuss new regulations, which resulted in a substantial agreement upon all points except one, and accordingly the proposed regulations, with this exception, were at once put into effect. An effort has also been made to improve the standard of appearance, and in accordance with your directions the designs of the more common styles used have been submitted to the Art Jury, and their recommendations have been transmitted to the various sign manufacturers.

The Bureau has received a large number of complaints against the practice of permitting the erection of signs which overhang the sidewalks. These complaints are, of course, against all signs, whether electrical or otherwise, although the Electrical Bureau has no jurisdiction over signs other than electrical. Considerable information upon the regulations and restrictions in force in other cities has been collected.

The Art Jury recommended, as a result of a separate study made by them of conditions in this and other cities, that no sign be allowed to project more than four feet from the building line. As some of the complainants insisted that signs were being erected in transgression of the restrictions of existing ordinances, the opinion of the City Solicitor was obtained upon the ordinance which allows the Director of Public Safety to authorize the erection of electrical signs at his discretion, that this discretion ought to be exercised within the limits or restrictions of those ordinances previously in effect. Therefore, on July 11, another conference of the signmakers was called and they were notified that after that date the discretion reposed in the Director of the Department of Public Safety to allow the erection of electric signs, would be exercised in the light of the ordinance of 1863, which restricts the extension of signs from the building line to a distance of 4 feet 3 inches, and to a height of 12 feet from the sidewalk. There have

been, of course, a number of protests and complaints against these restrictions; on the other hand, there have been a number of complaints because still greater restrictions were not imposed.

Electric Signs.

Number of permanent signs erected in 1912 673
 Number of permanent signs in existence, December 31, 1911... 2,497
 Number of permanent signs in existence, December 31, 1912... 3,170

Permits Issued.—Signs Erected.—Signs Inspected.

| | Permits issued | New | Signs erected | | Signs inspected |
|-----------------|-------------------|-----|------------------|-----------|--------------------|
| | | | Replace- ment | Temporary | |
| January | 80 | 75 | 5 | 1 | 80 |
| February | 70 | 66 | 3 | 1 | 70 |
| March | 98 | 88 | 9 | 1 | 98 |
| April | 94 | 87 | 9 | — | 46 |
| May | 62 | 57 | 16 | — | 73 |
| June | 119 | 51 | 9 | — | 66 |
| July | 62 | 81 | 11 | 1 | 100 |
| August | 48 | 46 | 10 | — | 108 |
| September | 55 | 45 | 11 | — | 119 |
| October | 86 | 87 | 19 | 23 | 189 |
| November | 81 | 45 | 17 | 2 | 157 |
| December | 102 | 45 | 32 | — | 210 |
| Totals..... | 957 | 673 | 151 | 29 | 1,311 |

*This number represents the total number of permits issued. Probably quite a number of them were for replacements; although prior to 1912 the number of replacement permits was not separated from the total number. On this account the numbers above given are probably somewhat in excess of the actual number of electric signs in place.

Moving-Picture Shows and Theaters.

| | Licenses issued | | | Number of inspections | |
|-----------------------------|-----------------|-------|-----------|-----------------------|-------|
| | Theatres | Shows | Operators | Theatres | Shows |
| January ----- | 89 | 81 | 2 | 52 | 35 |
| February ----- | 1 | 55 | 12 | 43 | 28 |
| March ----- | 1 | 19 | 14 | 46 | 38 |
| April ----- | — | 4 | 18 | 21 | 41 |
| May ----- | — | 2 | 19 | 30 | 78 |
| June ----- | — | 5 | 11 | 17 | 120 |
| July ----- | — | 4 | 10 | 14 | 158 |
| August ----- | — | 2 | 18 | 41 | 150 |
| September ----- | — | 1 | 15 | 58 | 119 |
| October ----- | — | — | 21 | 61 | 119 |
| November ----- | 2 | 1 | 11 | 64 | 101 |
| December ----- | — | — | 13 | 71 | 66 |
| Totals ----- | 43 | 174 | 164 | 518 | 1,153 |
| No. December 31, 1912 ----- | | | 43 | 174 | 870 |
| No. December 31, 1911 ----- | | | 41 | 164 | 706 |

Moving-Picture Shows.

Moving-picture shows are a considerable source of danger by reason of the inflammability of the films used, a fact which is emphasized by frequent newspaper accounts of accidents from this cause, a particularly horrible example being the fire reported in the French newspapers at Villareal, Spain, resulting in the loss of 84 lives.

Previous to March 1, what inspection had been given to such shows had been performed by a man on the labor roll, who, in addition to performing work for the Bureau, was discovered engaged in electrical contract work for his own account. This man was replaced by a very competent inspector from our staff, and a careful inspection of all

moving-picture shows and theaters started at once and has been carried to completion. While most of the electrical work was found to be in good condition, in quite a number of instances the wiring was extremely dangerous.

In connection with this work, the Chief of the Bureau attended the last meeting of the National Fire Protection Association, Boston, Mass., which devoted considerable time to the subject of moving-picture machines and shows, As a consequence of the discussion at this meeting, a study of the local conditions was started and, after several conferences with the Chief of the Inspection Department of the Philadelphia Fire Underwriters' Association, new regulations were prepared covering booths, both permanent and temporary, and methods of ventilation. In most cases the owners or managers of moving-picture shows have felt that the inspection and pointing out of dangers was of the greatest importance to them, and have promptly made the changes or conditions required. A few have hung back with the idea that through influence they would avoid the expense of making the required changes, and in a few cases it has required the actual closing of the shows in order to force the correction of dangerous conditions.

Electric Light and Power Wiring Inspections.

| Location. | Number. |
|--|---------|
| Bath House, City, Fifty-seventh and Summer streets..... | 1 |
| Bath House, City, Tacony street, north of Levick street..... | 1 |
| Bath House, Eighth and Green streets | 1 |
| Bath House, Twenty-second and Cumberland streets..... | 1 |
| Bath House, 734 Lombard street | 1 |
| Bath House, 511 South Third street | 1 |
| Bridge, Gray's Ferry | 11 |
| Bridge, Frankford creek | 6 |
| Bridge, Passyunk avenue | 14 |
| City Hall courtyard and tower, flaming arcs | 3 |
| Fire Station, Belgrade and Huntingdon streets..... | 1 |
| Free Library, West Philadelphia branch | 2 |

| Location. | Number. |
|--|---------|
| Home for the Indigent | 5 |
| Hospital, Municipal, new ward building | 8 |
| House of Correction, elevator | 1 |
| New Convention Hall, Broad street and Allegheny avenue.... | 31 |
| Olympia Athletic Association, Broad street, below Bainbridge street | 1 |
| Pier, Vine street, elevators | 4 |
| Pier, Vine street, lamps | 1 |
| Pier, Race street | 3 |
| Police Station, 40th District | 2 |
| Police Station, Tenth and Greenwich streets | 1 |
| Police Station, Fifty-fifth and Pine streets | 1 |
| Recreation park, Twenty-sixth and Jefferson streets..... | 6 |
| Recreation park, Fifty-sixth and Christian streets..... | 4 |
| Recreation park, Twenty-second street and Sedgley avenue.... | 4 |
| Recreation park, Ninth and Jefferson streets | 1 |
| Second Regiment Armory | 6 |
| Sewage Disposal Plant | 1 |
| West Philadelphia District High School | 270 |
| 2028 North Eighteenth street (dwelling) | 1 |
| Total | 395 |

Other Inspections.

| | |
|--|--------|
| Poles, city, number inspected | 4,139 |
| Poles of public service corporations inspected | 6,284 |
| Street arc-light circuits for amperage and voltage..... | 603 |
| Wires, length and support, public-service corporations | 572 |
| Total | 11,598 |

In addition to the above, the apparatus of the various systems and plants operated by the Bureau, the Elevator, Fire Alarm, Telephone and Police Patrol Systems, are systematically inspected, the number of such inspections reaching several thousand monthly.

Inspection or License Charges.

There is no charge for inspection of moving-picture shows, signs, theaters or underground construction.

The charges for poles and wires are as follows:

| | |
|---|--------|
| Poles, attachments to those belonging to the city, each..... | \$0.50 |
| Poles, erecting of additional (except trolley poles and poles in 35th and 41st Wards) each..... | 5.00 |
| Poles, maintenance of existing (except trolley poles and poles in 35th and 41st Wards) each, per year..... | 1.00 |
| Wires, electric light overhead, per mile, per year..... | 5.00 |
| Wires, telegraph and telephone overhead, per mile, per year.... | 2.50 |

Permits Issued to Public-Service Corporations.

| 1912 | January | February | March | April | May | June | July | August | September | October | November | December | Total |
|---|---------|----------|-------|-------|-----|------|------|--------|-----------|---------|----------|----------|-------|
| American District Telegraph Co.----- | 16 | — | — | — | 1 | 2 | — | 3 | 1 | 8 | 8 | 1 | 40 |
| American Telephone and Tel. Co.----- | 2 | — | — | — | — | — | — | — | — | — | — | — | 2 |
| Atlantic Refining Co.----- | — | — | — | — | — | — | — | — | 1 | — | — | — | 1 |
| Auxiliary Fire Alarm Co.----- | — | — | — | — | — | — | — | — | — | 1 | — | — | 1 |
| Bell Telephone Co.----- | 710 | 363 | 468 | 629 | 564 | 440 | 298 | 384 | 471 | 492 | 413 | 363 | 5,595 |
| Edison Electric Co.----- | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Girard Estate ----- | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Harrison Bros & Co.----- | — | — | — | — | — | — | — | — | 2 | — | 1 | — | 3 |
| Holmesburg, Tacony and Frankford Railway Co ----- | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Holmes Electric Protection Co.----- | 7 | 1 | 2 | 2 | 3 | — | 1 | — | — | — | 2 | 3 | 22 |
| Keystone Telephone Co.----- | 54 | 13 | 19 | 8 | 14 | 13 | 114 | 142 | 151 | 206 | 192 | 201 | 1,127 |
| New York News Bureau ----- | 1 | 2 | 13 | 5 | 8 | 6 | — | — | 1 | 3 | 2 | 1 | 42 |
| Pennsylvania Railroad Company ----- | 15 | 1 | — | — | — | — | 2 | — | 2 | — | 1 | 3 | 24 |
| Philadelphia and Reading Ry. Co.----- | 5 | — | — | 1 | — | — | 2 | 1 | — | 2 | 1 | 3 | 15 |
| Philadelphia, Reading and Pottsville Telegraph Co. ----- | — | — | — | — | — | — | — | — | — | — | — | — | — |

Permits Issued to Public-Service Corporations.—Continued.

| | January. | February. | March. | April. | May. | June. | July. | August. | September. | October. | November. | December. | Total. |
|---|----------|-----------|--------|--------|-------|-------|-------|---------|------------|----------|-----------|-----------|--------|
| Philadelphia Electric Co.----- | 743 | 639 | 967 | 1,041 | 676 | 663 | 854 | 813 | 711 | 731 | 1,060 | 636 | 9,504 |
| Philadelphia Local Telegraph Co.----- | 21 | 1 | 6 | 6 | 8 | 1 | 1 | 1 | — | 2 | 3 | 4 | 24 |
| Philadelphia Rapid Transit Co.----- | 31 | — | — | 1 | 1 | 1 | 1 | — | 4 | — | — | 2 | 41 |
| Pneumatic Fire Alarm Co.----- | 3 | — | — | — | 1 | — | 8 | — | — | — | — | — | 12 |
| Postal Telegraph Cable Co.----- | 10 | 2 | 1 | 4 | 2 | 4 | — | 5 | 10 | 8 | 15 | 1 | 62 |
| Roxborough, Chestnut Hill and Norristown Railway Co.----- | — | — | — | — | — | — | — | — | — | — | 1 | — | 1 |
| United Gas Improvement Co.----- | — | — | 2 | — | — | — | — | — | — | 1 | 3 | — | 6 |
| Western Union Telegraph Co.----- | 17 | 21 | 4 | 5 | 2 | 3 | 2 | 2 | 13 | 13 | 13 | 4 | 104 |
| Total----- | 1,635 | 1,093 | 1,482 | 1,702 | 1,280 | 1,133 | 1,283 | 1,351 | 1,363 | 1,472 | 1,735 | 1,222 | 16,756 |

PLANTS AND SYSTEMS.

City Hall Elevator System.

The plant consists of 22 hydraulic and one electric (for tower) elevators, receiving power from the City Hall heat, light and power plant.

The sum of \$100,000 having been appropriated for the improvement of the elevator plant, a careful study was made of the relative advantages and disadvantages of different types of elevators for this particular building. Following this plan, the specifications were made and contract awarded for the installation of five new passenger elevators, four at the southeast corner of the building and one at the southwest corner. A contract has also been awarded for the installation of a freight sidewalk lift at the northwest corner, which will do away with the blocking up of the first-floor corridors at that corner. It is expected that these new elevators will be in operation in the early spring. In order to generate the necessary power for these new elevators, one of the five generating units in the power plant has been rewound so as to furnish 220 volts. By this plan an expenditure of about \$15,000 was avoided, making this sum available for one more elevator.

A contract has also been awarded for extensive repairs to the Police Elevator No. 21. Equally extensive repairs have been made on elevators Nos. 1 to 6, inclusive, 12, 13, 14 and 15, and the elevator pumps Nos. 1 and 2 have been put in thorough repair. The elevator tank system has been cleaned, and, for the first time in years, the condition of the elevators is such that the Bureau of Elevator Inspection has been warranted in issuing their certificates of approval. The elevator service has been improved by arranging for an additional cleaning of all cars each day; by extending the time of running the elevator of City

Hall Tower from 3 until 4 o'clock P. M.; by changing the hours of the elevator starters so as to agree better with the needs of the traffic; by marking the number of each car over the elevator doors and by placing signs upon the cage of every car, stating the number of the car and the floors at which it will stop. Contracts have been awarded for new floors in all of the cars, upon completion of which the cars will be newly painted.

During the year two serious leaks have occurred in the system of piping, which were called to your attention in my letter of May 10, 1912. One of these leaks was in the piping near the northwest group of elevators, and the time occupied in making the necessary repairs caused a shut-down of Elevator No. 21 from September 17 to October 3. The other leak was due to a crack in the tank on the seventh floor, which had become weakened by corrosion. This resulted in a shut-down of the elevators on the west side of the building for a period of five hours. With the present system of piping, which was never good and which has been in use a long time, there will always be liability to accident of this kind, but the expense of remedying this piping is so great as to practically preclude its being done, and it is, therefore, necessary to countenance the present condition in the hope that funds will gradually be provided to replace all of the old elevator system.

During the summer months elevator operators and starters were permitted to wear alpaca coats, instead of the regular woolen cloth coats, which added greatly to their comfort.

There has been but one accident during the year, and that of the most trifling character, resulting only in the injury of the hat of a passenger.

The total number of car hours out of service for minor repairs was 2,011.

The following tables show the number of inspections, the number of minor repairs performed and the travel on the tower elevator.

Principal Work Done on the Elevator System.

| | 1911. | 1912. |
|--|-------|-------|
| Boxes, rod, repacked | 61 | 123 |
| Cylinders repacked | 31 | 51 |
| Valves, cut off, repacked | 21 | 20 |
| Valves, main and pilot, repacked | 57 | 80 |

Number of Inspections, Oiling and Cleaning Machinery.
1912.

| | Inspection. | Oiling. | Overlooking. |
|------------------------------|-------------|---------|--------------|
| Elevators Nos. 1 to 20 | 238 | 119 | 366 |
| Tower elevator | 12 | 72 | 366 |
| Turret, east | 12 | 120 | 366 |
| Turret, west | 12 | 72 | 366 |

Visitors Carried to City Hall Tower by Elevator.

| | 1911. | | 1912. | |
|-----------------|----------|-------|----------|-------|
| | Balcony. | Top. | Balcony. | Top. |
| January | 4,644 | 94 | 2,584 | 124 |
| February | 4,690 | 51 | 2,510 | 146 |
| March | 4,475 | 84 | 2,836 | 231 |
| April | 5,202 | 97 | 5,252 | 378 |
| May | 6,395 | 119 | 4,023 | 260 |
| June | 7,716 | 186 | 6,356 | 432 |
| July | 6,829 | 114 | 7,565 | 481 |
| August | 11,022 | 436 | 8,552 | 495 |
| September | 8,053 | 292 | 6,849 | 460 |
| October | 6,082 | 284 | 6,192 | 734 |
| November | 2,974 | 185 | 3,090 | 1,177 |
| December | 4,733 | 219 | 2,140 | 689 |
| Total | 72,815 | 2,161 | 57,949 | 5,607 |

Fire Alarm System.

The Fire Alarm System consists of a central exchange located in Room 626, City Hall, from which radiate circuits leading to the fire alarm boxes located on the

streets. Similarly circuits run from the central exchange to the fire houses, police stations, insurance patrol, etc. When a street box is pulled, a signal corresponding to the number of the box is received by a bell in the central exchange and recorded on a tape register. The operators in the central exchange send out to the fire stations the number of the box by means of an electric mechanical signal transmitter, and the engine companies answer this signal according to directions laid down by the Bureau of Fire. Alarms received by telephone are transmitted to the Bureau of Fire, and they give directions as to what engines to send by telephoning to the proper fire house.

*Signal Boxes.**

| | 1911. | 1912. |
|--|-------|-------|
| Number of signal boxes on underground lines..... | 576 | 586 |
| Number of signal boxes on overhead lines..... | 1,265 | 1,304 |
| Total | 1,841 | 1,890 |

Signal Boxes Added During 1912.

| | |
|-------------------|----|
| Overhead | 39 |
| Underground | 5 |
| Auxiliary | 5 |
| Total | 49 |

Previous annual reports, in giving the total number of boxes, were incorrect, as they represented the boxes to which numbers had been assigned rather than the number of boxes actually erected and in use.

STATIONS ON FIRE ALARM CIRCUITS.

List of Those Receiving Fire Alarms.

| | |
|-----------------------------|----|
| Fire engine companies | 56 |
| Truck companies | 15 |
| Chemical companies | 6 |

* Includes police stations and other telephone stations to which regular box numbers had been assigned.

| | |
|------------------------------------|------------|
| Boats, fire and police | 5 |
| Insurance patrols | 3 |
| Water tower | 1 |
| High pressure stations | 2 |
| High pressure hose wagons | 3 |
| High pressure cannon wagon | 1 |
| Fire department officials | 14 |
| Police stations | 45 |
| Police surgeons | 4 |
| Water department stations | 4 |
| Public service corporations | 26 |
| Offices in City Hall | 4 |
| Newspaper offices | 2 |
| Corporations | 2 |
| Veteran firemen associations | 3 |
| Total | 196 |

For a considerable period the number of fire boxes on a circuit has been entirely too high, and during the year we have added two more circuits as a step toward correcting this difficulty. Plans are well under way for a considerable extension along this line during the ensuing year. In addition, two telephone circuits leading to fire stations were split.

see pages 55 & 56
The following table shows in detail the extent of operations of the fire alarm system and the troubles experienced during the year. The street boxes out of service, which are almost entirely due to troubles upon lines, were 5,891 box hours for that portion which is attached to underground lines, as against 25,373 for that portion attached to overhead lines; that is to say, roughly, in the ratio of four times as many hours out of service for the overhead as for the underground. This comparison shows how important it is to have fire alarm wires underground. In this direction some progress has been made this year, as shown by the table, and also by the fact that 25 miles of its circuits have been placed underground during the year. Further underground work is almost completed, which will enable us to change connections of many more boxes now on the overhead lines.

*Fire Boxes Erected.**Overhead System.*

| Number. | Location. |
|---------|---|
| 2335 | Convention Hall, Broad street and Allegheny avenue. |
| 2336 | Convention Hall, Broad street and Allegheny avenue. |
| 2813 | Knox and Hansberry streets. |
| 2814 | Seventh street and Olney avenue. |
| 2815 | Ridge avenue and School lane. |
| 2816 | Fifty-fourth street and Cedar avenue. |
| 2817 | Forty-sixth and Pine streets. |
| 2818 | Fifty-second and Locust streets. |
| 2819 | Sixtieth and Christian streets. |
| 2821 | Duncannon and Carlisle streets. |
| 2858 | Wayne avenue and Westview street. |
| 2859 | Sixty-first and Pine streets. |
| 2861 | Twenty-eighth and Morris streets. |
| 2862 | Rising Sun lane and Tyson street, Lawndale. |
| 2863 | Johnson and Musgrave streets. |
| 2864 | Greene and Luray streets. |
| 2865 | Coulter and Laurens streets. |
| 2867 | Cheltenham and Stenton avenues. |
| 2868 | Fifty-eighth and Whitby streets. |
| 2869 | Forty-seventh and Locust streets. |
| 2871 | Eighty-fourth and Eastwick streets. |
| 2872 | Fifty-fourth street and Gray's avenue. |
| 2873 | Tenth street and Duncannon avenue. |
| 2881 | Seventh and Luzerne streets. |
| 2882 | Tenth street and Erie avenue. |
| 2883 | Terrace and Markle streets. |
| 2884 | Ripka and Pechin streets. |
| 2885 | Cheltenham avenue and Chew street. |
| 2886 | Hartwell lane and Seminole avenue. |
| 2887 | Arrott and Franklin streets. |
| 2889 | Oxford avenue and Wakeling street. |
| 2891 | Foulkrod and Willow streets. |
| 2892 | Front street and Erie avenue. |
| 2893 | Island road and Glenmore avenue. |
| 2894 | Sixty-fourth street and Greenway avenue. |
| 2895 | Fifty-eighth street and Springfield avenue. |
| 2896 | Fifth street and Olney avenue. |
| 2897 | Thirteenth and Nedro streets. |
| 2898 | Twelfth street and Indiana avenue. |

Underground System.

| Number. | Location. |
|---------|---|
| 2496 | Tenth street and Columbia avenue. |
| 2812 | Howard and Berk streets. |
| 2866 | Beach street and Susquehanna avenue. |
| 2874 | Third and Christian streets. |
| 2875 | Third street and Washington avenue. |
| 2876 | Ninth and Locust streets. |
| 2877 | Tenth and Vine streets. |
| 2878 | Nineteenth and Wallace streets. |
| 2879 | Frankford avenue and Richmond street. |
| 3516 | Blum Bros. (private), Tenth and Market streets. |

Besides the additions shown above, five additional auxiliary fire alarm boxes were installed during the year 1912.

Municipal and Police and Fire Telephone Systems.

The City of Philadelphia maintains the largest municipal telephone exchange in the world. It consists of a central exchange in Room 612, having a switchboard with 543 stations connected by 100 trunks to the Bell Telephone system, and a similar switchboard with 496 stations connected by 40 trunks to the Keystone Telephone Company's switchboard.

During the year 101 Bell telephones were installed and 41 disconnected, and 52 Keystone telephones were installed and 21 disconnected.

The Bell and Keystone switchboards connected with the police stations are located in Room 629. There is also a separate Keystone switchboard with direct connections to every pawnbroking establishment in the city. These police boards are connected to the larger boards in Room 612 by trunks, but as they are used for police service, have been placed in a separate room, which is kept locked.

In addition to the above, there are also private branch exchanges located as follows:

Bell System.

City Treasurer.
 Department of Wharves, Docks and Ferries.
 Civil Service Commission.
 Bureau of Highways and Street Cleaning.
 Bureau of Water.
 Department of Health and Charities.
 Department of Public Works.

Keystone System.

Department of Wharves, Docks and Ferries.
 Civil Service Commission.
 Bureau of Highways and Street Cleaning.
 City Treasurer.

The total number of instruments connected is about 1,500. Most of the lines are owned by the City and maintained by the Electrical Bureau forces. In addition to the above described system, branch exchanges are installed and service maintained in the City hospitals, viz.: The Philadelphia Hospital, Municipal Hospital and the Home for the Indigent.

About 40 operators are required to handle this system; several operators are employes of the Bureau of Police, detailed to operate the police section after they have been properly instructed by the Electrical Bureau operators.

The work thrown upon the above system has increased from year to year, although additional provision has been made for more operators, shown by the following tables. In spite of this fact, the service has been considerably improved during the past year in point of rapidity in which calls are answered. Many hundred tests made from outside exchanges show the following result:

Average Time Elapsing Before Electrical Bureau Answers (seconds.)

| | Mar. | July. | Aug. | Sept. | Oct. | Nov. | Dec. |
|-------------|------|-------|------|-------|------|------|------|
| Bell | 10.8 | 7.3 | 7.05 | 6.8 | 7.3 | 5.4 | 5.0 |
| Keystone .. | ... | 4.94 | 5.02 | 5.11 | 4.48 | 4.19 | 4.4 |

Even with this increased rapidity in handling calls, the amount of work has become so great that operators are under a severe pressure at certain periods, and either the service must suffer or additional operators must be provided.

Extent and Growth of Telephone Service.

| | 1908 | 1909 | 1910 | 1911 | 1912 |
|--|-----------|-----------|-----------|-----------|-----------|
| Number Electrical Bureau operators ----- | 30 | 30 | 30 | 30 | 30 |
| Number sub-operators detailed from Bureau of Police ----- | 8 | 9 | 12 | 8 | 9 |
| Total number of operators | 38 | 39 | 42 | 38 | 39 |
| Total stations on Bell and Keystone (approximate), municipal and police sections ----- | 729 | 1,060 | 1,077 | 1,136 | 1,196 |
| Total connections, Bell and Keystone (municipal and police) ----- | 2,592,839 | 3,146,441 | 3,683,826 | 3,963,073 | 4,491,538 |
| Total outgoing trunk calls, Bell and Keystone (municipal) ----- | 656,415 | 796,570 | 919,956 | 1,045,467 | 1,117,941 |
| Total incoming and intercommunicating calls (municipal and police)----- | 1,936,424 | 2,349,871 | 2,713,870 | 2,938,206 | 3,373,647 |

Telephone System—Police Section.

| | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Total |
|---|--------|--------|--------|--------|--------|--------|--------|--------|--------|---------|--------|---------|-----------|
| Messages (written and recorded) received, Bell and Keystone. | 10,932 | 11,459 | 11,673 | 12,153 | 11,982 | 11,867 | 11,623 | 12,337 | 11,277 | 12,131 | 12,110 | 13,220 | 142,884 |
| Messages (written and recorded) sent, Bell and Keystone. | 15,945 | 14,107 | 15,716 | 19,092 | 12,985 | 16,217 | 17,218 | 16,638 | 16,471 | 17,068 | 16,139 | 17,118 | 195,224 |
| Total (written and recorded) received and sent over Bell and Keystone | 26,897 | 25,566 | 27,389 | 31,755 | 24,967 | 28,084 | 28,841 | 29,025 | 27,748 | 29,249 | 28,249 | 30,338 | 338,108 |
| Total calls or connections on Bell board | 83,435 | 76,332 | 86,265 | 83,157 | 84,729 | 80,050 | 77,190 | 69,228 | 80,100 | 104,398 | 95,476 | 101,758 | 1,022,168 |
| Total calls or connections on Keystone board | 24,694 | 33,931 | 38,321 | 36,951 | 37,630 | 38,960 | 36,247 | 32,966 | 38,448 | 49,714 | 46,574 | 48,456 | 470,871 |
| Total calls or connections, pawnbrokers' section | 2,041 | 2,200 | 2,275 | 2,234 | 2,403 | 2,676 | 2,625 | 2,526 | 2,256 | 2,890 | 2,908 | 3,304 | 30,359 |
| Stations connected to Bell | — | — | — | — | 9 | 15 | 2 | — | 5 | 1 | 3 | 2 | 37 |
| Stations disconnected, Bell | — | — | — | — | — | — | — | — | 1 | — | — | — | 1 |
| Stations connected to Keystone | — | — | — | — | — | — | — | — | 2 | 1 | 1 | — | 4 |
| Stations disconnected, Keystone | — | — | — | — | — | — | — | — | — | 1 | — | — | 1 |
| Bell | 58 | 58 | 58 | 58 | 67 | 82 | 84 | 84 | 88 | 89 | 92 | 94 | — |
| Keystone | 60 | 60 | 60 | 60 | 60 | 60 | 60 | 60 | 61 | 62 | 63 | 63 | — |
| Total stations | 118 | 118 | 118 | 118 | 127 | 142 | 144 | 144 | 149 | 151 | 155 | 157 | — |
| Bell | 27 | 17 | 16 | 33 | 34 | 34 | 12 | 33 | 38 | 24 | 35 | 28 | 331 |
| Keystone | 10 | 7 | 11 | 38 | 20 | 20 | 6 | 21 | 20 | 24 | 29 | 46 | 252 |
| Troubles cleared | 37 | 24 | 27 | 71 | 54 | 54 | 18 | 54 | 58 | 48 | 64 | 74 | 533 |

APPENDIX A

1. Introduction

The first part of the appendix

describes the general principles of the method

and the results of the calculations

2. Method of calculation

The method of calculation is described in detail

in the following sections

The results of the calculations are given in

3. Results of calculations

The results of the calculations are given in

the following sections

The results of the calculations are given in

the following sections

The results of the calculations are given in

the following sections

The results of the calculations are given in

the following sections

The results of the calculations are given in

the following sections

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the following sections

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the following sections

Fire Alarm System.

| | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Total |
|--------------------------------|------|------|------|------|-----|------|------|------|-------|------|------|------|-------|
| BOX ALARMS: | | | | | | | | | | | | | |
| First alarms ----- | 76 | 66 | 57 | 51 | 47 | 54 | 47 | 51 | 50 | 51 | 60 | 57 | 667 |
| Second alarms ----- | 3 | 6 | 1 | 4 | 2 | 2 | 2 | 2 | 4 | 3 | 4 | 4 | 37 |
| Third alarms ----- | 2 | 2 | -- | 1 | 1 | -- | 1 | 1 | 1 | 2 | 1 | -- | 12 |
| Fourth alarms ----- | 1 | 1 | -- | -- | -- | -- | -- | -- | -- | 1 | -- | -- | 3 |
| Fifth alarms ----- | 1 | 1 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 2 |
| Sixth alarms ----- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| False alarms ----- | 1 | -- | -- | -- | -- | -- | 2 | 3 | 1 | 1 | 3 | 1 | 12 |
| Malicious alarms ----- | 3 | -- | -- | 3 | 2 | 3 | 1 | -- | 1 | 1 | -- | 2 | 16 |
| Total ----- | 87 | 76 | 58 | 59 | 52 | 59 | 53 | 57 | 57 | 59 | 68 | 64 | 749 |
| LOCAL ALARMS: | | | | | | | | | | | | | |
| Local alarms by telephone, etc | 875 | 238 | 255 | 197 | 205 | 234 | 223 | 179 | 152 | 210 | 237 | 203 | 2,823 |
| False alarms, malicious ----- | -- | -- | -- | -- | -- | -- | -- | 4 | 2 | -- | 4 | 1 | 7 |
| False alarms, others ----- | -- | -- | -- | -- | -- | 2 | 1 | 4 | 5 | 7 | 14 | 17 | 50 |
| Total ----- | 875 | 238 | 255 | 197 | 205 | 236 | 223 | 188 | 159 | 217 | 305 | 236 | 2,885 |
| Circuit troubles: | | | | | | | | | | | | | |
| Underground ----- | 33 | 19 | 42 | 30 | 33 | 41 | 23 | 46 | 28 | 50 | 26 | 32 | 403 |
| Overhead ----- | 51 | 73 | 68 | 76 | 104 | 73 | 93 | 101 | 97 | 26 | 59 | 67 | 888 |
| Total ----- | 84 | 92 | 110 | 106 | 137 | 114 | 121 | 147 | 125 | 76 | 85 | 99 | 1,296 |

Fire Alarm System—Continued.

| | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Total |
|---|-------|-------|-------|-------|-------|-------|---------|---------|---------|---------|--------|----------|-----------|
| Street boxes out of service in box hours: | | | | | | | | | | | | | |
| Underground | 1,086 | 194 | 439 | 373 | 701 | 1,200 | 304.8 | 378.5 | 186.2 | 231.9 | 125.47 | 704.94 | 5,891.81 |
| Overhead | 2,949 | 2,792 | 2,503 | 2,978 | 1,933 | 2,573 | 1,094.0 | 1,400.6 | 3,613.6 | 1,026.2 | 869.35 | 1,817.07 | 25,373.82 |
| Total | 3,935 | 2,986 | 2,942 | 3,356 | 2,639 | 3,773 | 1,398.8 | 1,569.1 | 3,811.8 | 1,258.1 | 994.82 | 2,522.01 | 31,265.63 |
| Circuits out of order in station hours: | | | | | | | | | | | | | |
| Joker—underground | 42 | 32 | 53 | 95 | — | — | 2.50 | 21. | 8.53 | 0. | 5. | 27.53 | 291.61 |
| Joker—overhead | 107 | 87 | 73 | 175 | 224 | 56 | 94.25 | 85.56 | 81.10 | 8. | 8.91 | 11.69 | 1,076.51 |
| Alarm—underground | 107 | 8 | 100 | — | — | — | 49.75 | 66.23 | 16.50 | 7.83 | — | 12.00 | 427.36 |
| Alarm—overhead | 87 | 105 | 84 | 160 | 92 | 61 | 122.80 | 115.16 | 198.05 | 95.98 | 32.53 | 89.40 | 1,242.95 |
| Trouble—signal box hours: | | | | | | | | | | | | | |
| Percentage of totals | .23 | .23 | .20 | .24 | .18 | .27 | .09 | .111 | .271 | .084 | .071 | .171 | 0.185 |
| Trouble—joker circuits: | | | | | | | | | | | | | |
| Percentage of totals | .15 | .13 | .14 | .23 | .23 | .06 | .096 | .105 | .092 | .008 | .014 | .033 | 0.109 |
| Trouble—alarm circuits: | | | | | | | | | | | | | |
| Percentage of totals | .19 | .12 | .13 | .16 | .06 | .06 | .169 | .178 | .217 | .102 | .033 | .157 | 0.153 |

HEAT, LIGHT AND POWER PLANT OF CITY HALL.

The heating is done partly by indirect and partly by direct radiation; the exhaust steam from the elevator pumps is used, supplemented by live steam when needed. Current for lighting and power is furnished by 110-volt direct-current generators. Hydraulic power is furnished for the elevator system by the system of pumps.

Boiler Room.

The equipment consists of four batteries of 375-horse-power Babcock and Wilcox boilers in each of the two boiler rooms, making a total of 3,000 horsepower. Buckwheat coal is used.

| | |
|-------------------------|-------------|
| Tons used in 1911 | 21,690 |
| Tons used in 1912 | 19,236 |
| Saving in 1912 | 2,454 tons. |

As the cost of this coal is \$3.77 per ton, and the cost of hauling ashes per load is \$2, the approximate saving is \$10,000. The principal reasons for this saving are better discipline and methods in the firerooms, the improvement of pumping machinery, the cutting off unnecessary lamps and the substitution of Tungsten lamps for less efficient carbon filament lamps.

The following table shows some of the principal repairs:

| | |
|-------------------------------------|----|
| Boiler tubes renewed | 50 |
| Grate bars renewed | 39 |
| Gauge glasses renewed | 74 |
| Brickwork renewed in furnaces | 8 |

Formerly the boilers were supplied with Schuylkill river water, but connections have now been made so as to make use of the Delaware River water, which produces less scale.

Steam Piping.

As pointed out in the letter of May 10, 1912, the steam piping was never properly installed and in many places was leaking badly. Plans and specifications were made as promptly as possible to remedy these conditions. As our appropriations would not permit the extension of all this work, transfers were asked for on September 19, but were not granted until November 14. In the meantime two dangerous leaks developed, and we were obliged to replace some sections of a large pipe and go to an expense which would not have been necessary if we could have had awarded contracts earlier in the year. As soon as funds were available contracts were executed for additions and changes in the high-pressure steam piping, which, when installed, will considerably improve the condition of this portion of the piping.

In order to make use of the exhaust steam from the engines, which has hitherto been wasted, plans and specifications have been made and contracts executed for alterations to the low-pressure steam piping, which when carried out will result in a still further saving in the amount of coal used.

The following are the principal minor repairs made:

- Installed new 10-inch Simplex pipe clamp on main steam pipe in oil room.
- Repaired blow-off pipe back of Nos. 3 and 4 boilers.
- Installed a new 4-inch suction pipe, west boiler room.
- Installed a new 2-inch mountain feed pipe, No. 3 boiler.
- Replaced one 3-inch Jenkins valve.
- Replaced two 3-inch mountings.
- Replaced two 3-inch discs.
- Replaced one 5-inch disc.
- Replaced one 3-inch joint.
- Renewed 14-foot length of 10-inch steam piping leading to dynamo room.
- Made joint on mountings of 10-inch valve on main by engine No. 3, and packed two drip valves on same line.

Packed 10-inch valve by No. 5 engine.
Renewed one 2-inch mounting.
Renewed eight 3-inch water valves.
Replaced one 8-inch joint.
Replaced one 5-inch joint.
Replaced one 8-inch disc.
Renewed two studs.

Engine Room.

The engine room contains five direct-connected generating units, each consisting of a 300-horsepower Simple Ames center-crank engine driving a 200-kilowatt, 110-volt Westinghouse compound generator.

The switchboard is of good design, well equipped with instruments and circuit-breakers and planned so that a considerable part of the load may be thrown on to the emergency service of the Philadelphia Electric Company.

The connected load consists of approximately 300 arc lamps, 15,000 incandescent lamps, and 80 horsepower in motors.

The actual load on an average winter's day is between 2,500 and 3,000 amperes from 8 P. M. until 7 A. M., when it begins to increase and goes up steadily to a little over 5,000 amperes about 3 o'clock, where it stays for an hour and then drops rapidly to about 3,000 amperes.

The total watt hours for the year has been 2,863,639,000.

The principal repairs in the engine room were made on Engine No. 3, whose crankshaft was broken earlier in the year. On engines Nos. 1, 2 and 5 new governor pins were installed and the arms bushed and the eccentric rod boxes were faced off.

A study of the elevator situation having determined the advisability of making new elevators of the electric type, it became necessary to arrange for sufficient electric power of 220 volts, as the five generators in the power plant were

all wound for 110 volts. It was decided to rewind one of them, and, since No. 3 was dismantled in process of repair, this was naturally picked out and a contract made for the rewinding. The use of this generator for the elevator system of course lessens the amount of electric power available for lighting. This situation has been taken care of, however, by the installation of a large number of incandescent lamps, whose efficiency is much greater than the old carbon filament lamps.

The main switchboard was provided with metal nameplates for each circuit, which should have been done when the switchboard was first installed.

Pumping Plant.

The pumping plant consists of the following pumps:

Elevator Pumps.

Four 18½ x 29-inch steam, 16-inch water end, 18-inch stroke Worthington compound duplex, sliding valve.
One about the same size, rotary valve.

Well Pumps.

One 7½-inch steam, 4½-inch water, 10-inch stroke, Worthington.
One 10-inch steam, 5-inch water, 10-inch stroke, Gordon & Maxwell.
One 10-inch steam, 5-inch water, 10-inch stroke, Holly.
One 10-inch steam, 4½-inch water, 10-inch stroke, Holly.

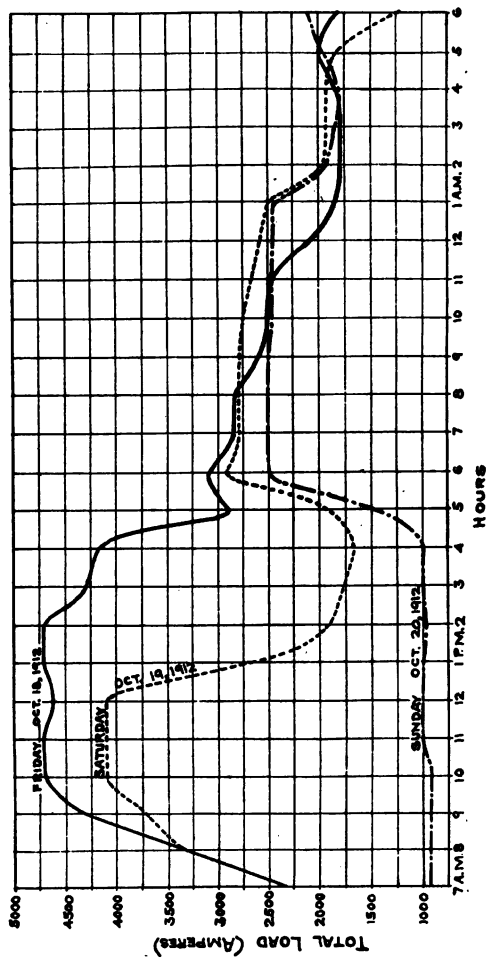
Boiler Feed Pumps.

Two 10-inch steam, 7-inch water, 10-inch stroke, Worthington.

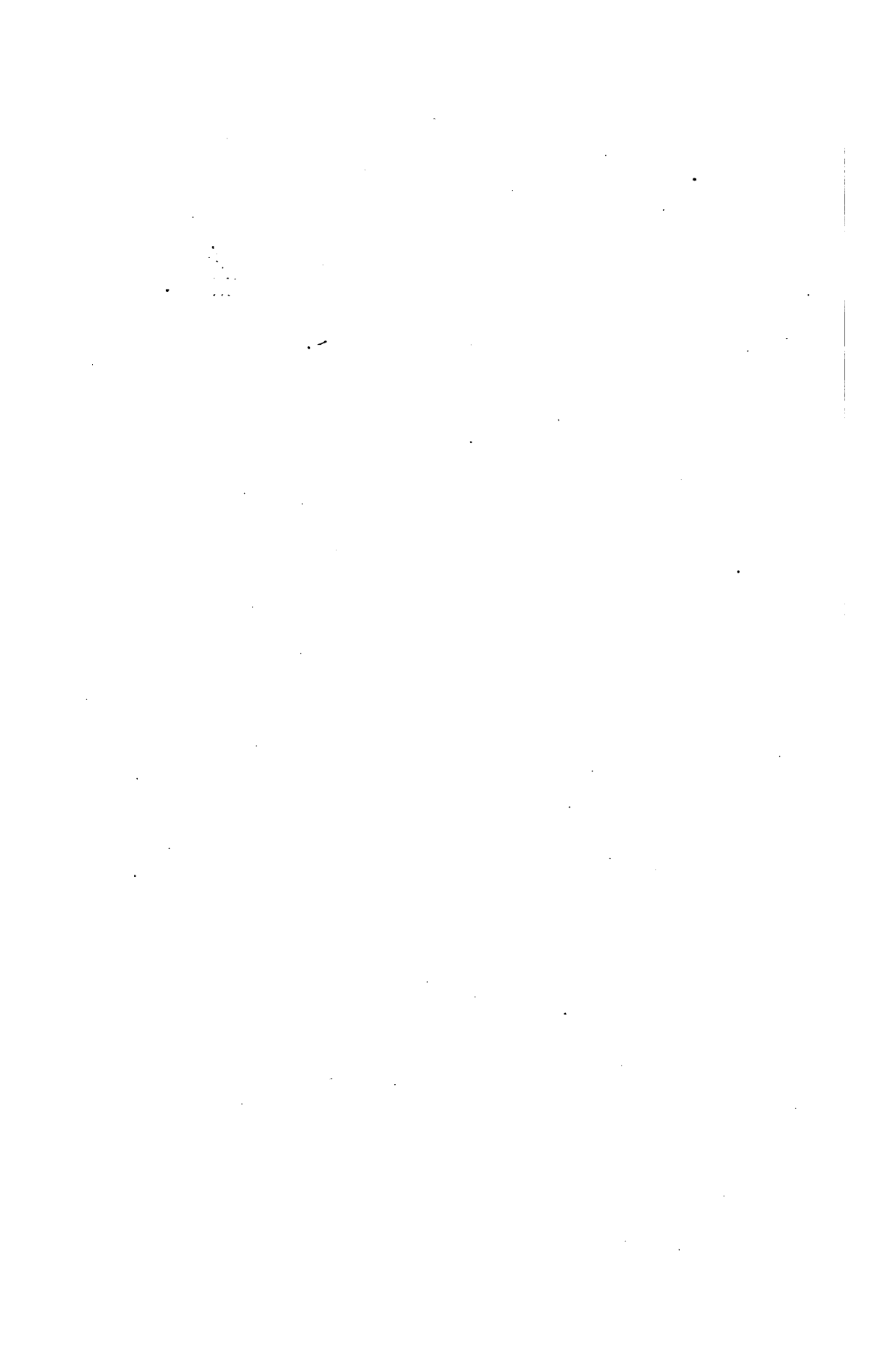
House Pumps.

One 12-inch x 17-inch steam, 11-inch water, 15-inch stroke, Barr compound.
One 12-inch x 20-inch steam, 10½-inch water, 18-inch stroke, Holly.

These pumps are very uneconomical at best, and have been allowed to get into rather poor condition by reason of lack of funds. The water ends of Nos. 1 and 2 elevator pumps have been put in thorough repair. Other pumps



ELECTRICAL OUTPUT OF CITY HALL POWER PLANT



have been partially overhauled by our own forces. Elevator pumps Nos. 3 and 5, boiler pumps Nos. 1 and 2, and well pumps in both boiler rooms were also put in thorough repair.

Sixty-four new water valves have been placed on elevator pumps Nos. 2 and 4.

Four new water valves have been placed on elevator pump No. 5.

Sixteen new valves have been placed on feed pump No. 2.

Thirteen new valves have been placed on feed pump No. 3.

Four new valves have been placed on well pump.

The heat, light and power plant has never been equipped with the necessary apparatus by which to compute the cost of power furnished to the three systems, viz., the heating system, the lighting system and the elevator system of City Hall. Specifications for such apparatus have been provided and contracts made and a portion of the apparatus installed. This includes a set of platform scales in each boiler room for weighing the coal and ashes.

ELECTRICAL CONSTRUCTION IN CITY BUILDINGS.

Electric Light and Power Wiring.

Outside of City Hall, the principal work consisted of the following installations:

Fire Stations:

- Fifty-fifth and Pine streets.
- Sixth street and Lehigh avenue.
- Belgrade and Huntingdon streets.
- Snyder avenue, west of Fifteenth street.

Police Stations:

- Fifty-fifth and Pine streets.
- Twenty-eighth street, north of Oxford street.

Bath Houses:

Summer street, east of Fifty-seventh street.

Tacony street, west of Levick street.

Piers:

No. 19, north.

Sewage Disposal Plant:

Pennypack Creek Station.

Service Wires and Storage Battery Charging Panel:

Race Street Pier.

Electrical Decorations, Frankford Historical Week:

Engine No. 7.

Engine No. 14.

Electrical Bureau Store House:

No. 1517 Filbert street.

Crematorium:

Second and Luzerne streets.

In City Hall, the electrical work may be divided into electric light and power wiring and electric signal work. The former consists largely of the trimming of arc lamps, cleaning of globes for arc lights and the memorial standard lights on the Plaza, the replacing of lamps and fuses, minor repairs to the wiring system and changes in or additions to the electric light wiring of the various offices in the building. Among the principal jobs of this character are the following installations:

16 new arc lamps at the top of City Hall tower.

13 2-light desk fixtures for the Receiver of Taxes.

8 side brackets for Room 384, Board of Reviewers.

1 ceiling fixture for Room 384, Board of Reviewers.

4 pendants for Room 625, Magistrate's Court.

4 arc lamps at first floor entrances.

8 electric signs for the Receiver of Taxes.

1 motor for printing press in Room 826-B.

6 flaming arcs in courtyard.

The booths for the Conservation of Water Exhibit in courtyard.

New lamps and shades for Room 762, Recorder of Deeds.

New wiring for 33 typewriting machines in Room 762.

New lamps and shades for Room 153, Recorder of Deeds.

Electrical decorations on the exterior of City Hall for New Years.

The decoration of the Mayor's Reception Room and approaching corridors for New Year's Reception.

The following table shows the minor operations:

Sundry Repairs to Electric Lighting and Power Service During the Year 1912.

| | January. | February. | March. | April. | May. | June. | July. | August. | September. | October. | November. | December. | Totals. |
|---------------------------|----------|-----------|--------|--------|------|-------|-------|---------|------------|----------|-----------|-----------|---------|
| In bath houses..... | — | — | — | — | — | 9 | — | — | 1 | — | — | — | 10 |
| In City Hall..... | 467 | 381 | 448 | 390 | 422 | 441 | 428 | 431 | 504 | 482 | 521 | 508 | 5,418 |
| In fire boats..... | — | — | — | 2 | 1 | — | — | 2 | — | — | 3 | 2 | 10 |
| In fire headquarters..... | — | — | 3 | 3 | — | — | 2 | — | 1 | — | — | — | 8 |
| In fire houses..... | 21 | 22 | 11 | 10 | 17 | 16 | 17 | 15 | 29 | 12 | 20 | 19 | 219 |
| In patrol stations..... | 7 | 6 | 7 | 1 | 3 | — | 10 | 5 | — | — | — | — | 39 |
| In piers..... | — | — | — | — | 2 | — | — | 8 | 5 | 1 | 1 | 2 | 19 |
| In police boats..... | 2 | — | — | 2 | — | — | — | 3 | — | 4 | — | 2 | 12 |
| In police stations..... | 20 | 24 | 19 | 16 | 48 | 31 | 31 | 22 | 23 | 39 | 41 | 40 | 354 |
| In Morgue..... | — | — | — | 1 | — | — | — | — | — | — | — | — | 1 |
| In van stables..... | — | — | — | — | 3 | — | — | — | — | 1 | 3 | 2 | 9 |
| Totals..... | 517 | 433 | 488 | 424 | 406 | 497 | 488 | 485 | 563 | 539 | 589 | 570 | 6,089 |

Police Patrol Signal System.

Each police station in the City contains a central office telephone and a signal set to which is connected, by means of overhead or underground wires, a series of police patrol signal boxes located generally at street corners. These boxes contain a device for sending in to the station a telegraphic signal, which is recorded on a tape register. The boxes also contain a telephone by means of which the patrolman may speak with the house sergeant.

| | |
|--|-----|
| The total number of police patrol signal boxes, December 31, 1911 | 816 |
| The total number of police patrol signal boxes, December 31, 1912 | 828 |
| The total number of police patrol signal boxes installed during 1911 | 12 |
| The total number of police patrol signal boxes installed during 1912 | 12 |
| The total number of old booth boxes replaced during 1912.... | 6 |
| Total police stations with central equipment | 40 |

In addition to the installation of the patrol boxes, the most important addition to the system was the complete equipment of the new Fortieth District Station House, consisting of a wall terminal board with 28 plush protectors, 28 fuses, 14 lightning arresters, a central office set of the latest type with shearing register, relay, motor generator and storage battery equipment.

Patrol Boxes Erected.

Overhead System.

| Police District. | Location. |
|------------------|---|
| Thirteenth— | School and Gypsy lanes. |
| Fourteenth— | Wister Station, Philadelphia and Reading Railway. |
| Fourteenth— | Carpenter Station, Pennsylvania Railroad. |
| Fourteenth— | Rubican and Ashmead streets. |
| Fifteenth— | Adams and Rowan streets. |
| Seventeenth— | Eighteenth street and Snyder avenue. |

Police District. Location.
 Twenty-fourth—Auburn and Almond streets.
 Thirty-fourth—Rosewood and Porter streets.
 Thirty-fourth—Fifteenth and Morris streets.
 Thirty-sixth—Fifth street and Allegheny avenue.
 Thirty-sixth—Germantown and Allegheny avenues.

Underground System.

Tenth—Eighth National Bank (Second street and Girard avenue).

Two thousand seven hundred and eighty-four (2,784) minor repairs to patrol boxes and instruments in station houses were made during 1912.

Booth Patrol Boxes Replaced by Wall Patrol Boxes.

Police District. Location.
 Fourteenth—Germantown avenue, opposite Stanton street.
 Fourteenth—Walnut lane and Wissahickon avenue.
 Seventeenth—Nineteenth and Reed streets.
 Twenty-ninth—City avenue, east of Fifty-fourth street.
 Twenty-ninth—Lancaster and City avenues.
 Thirty-fourth—Seventeenth street, south of Ellsworth street.

Patrol Boxes in Use.

| District. | Old style. | New style. | Wall. | Private. | Totals. |
|------------------|------------|------------|-------|----------|---------|
| First | — | — | 15 | — | 15 |
| Second | — | — | 17 | 1 | 18 |
| Third | — | — | 19 | 2 | 21 |
| Fourth | — | — | 19 | 1 | 20 |
| Fifth | — | — | 14 | 6 | 20 |
| Sixth | — | — | 17 | 4 | 21 |
| Seventh | — | — | 19 | — | 19 |
| Eighth | — | — | 21 | — | 21 |
| Ninth | — | — | 21 | 2 | 23 |
| Tenth | — | — | 14 | 1 | 15 |
| Eleventh | — | — | 19 | — | 19 |
| Twelfth | — | — | 27 | — | 27 |
| Thirteenth | — | 17 | 5 | 2 | 24 |

Patrol Boxes in Use—Continued.

| District. | Old style. | New style. | Wall. | Pri- vate. | Totals. |
|---------------------|---------------|---------------|-------|---------------|---------|
| Fourteenth..... | — | 24 | 18 | 4 | 46 |
| Fifteenth..... | — | 18 | 12 | 2 | 27 |
| Sixteenth..... | — | 5 | 17 | 1 | 23 |
| Seventeenth..... | — | 3 | 21 | — | 24 |
| Eighteenth..... | — | — | 29 | — | 29 |
| Nineteenth..... | — | — | 21 | 1 | 22 |
| Twentieth..... | — | — | 13 | 1 | 14 |
| Twenty-first..... | — | — | 14 | 2 | 16 |
| Twenty-second..... | — | — | 9 | — | 9 |
| Twenty-third..... | — | — | 18 | 2 | 20 |
| Twenty-fourth..... | 5 | 4 | 19 | — | 28 |
| Twenty-fifth..... | — | 1 | 9 | — | 10 |
| Twenty-sixth..... | — | 8 | 15 | — | 23 |
| Twenty-seventh..... | 4 | 7 | 22 | — | 33 |
| Twenty-eighth..... | — | — | 20 | — | 20 |
| Twenty-ninth..... | 1 | 6 | 22 | — | 29 |
| Thirtieth..... | — | 10 | 13 | — | 23 |
| Thirty-first..... | — | 5 | 10 | — | 15 |
| Thirty-second..... | 2 | 4 | 11 | — | 17 |
| Thirty-third..... | 4 | 2 | 10 | — | 16 |
| Thirty-fourth..... | — | 7 | 7 | 1 | 15 |
| Thirty-fifth..... | — | 5 | 16 | — | 21 |
| Thirty-sixth..... | 1 | 1 | 18 | — | 20 |
| Thirty-seventh..... | 1 | 5 | 18 | — | 24 |
| Thirty-eighth..... | — | 5 | 5 | — | 10 |
| Thirty-ninth..... | — | — | 18 | — | 18 |
| Fortieth..... | — | — | 13 | — | 13 |
| Totals..... | 18 | 132 | 645 | 33 | 828 |

HIGH PRESSURE TELEPHONE SYSTEM.

This system consists of telephone instruments placed in iron boxes mounted on iron posts and located at frequent intervals along the high pressure water mains.

The first installation covered the district from Locust street to Callowhill street, between Broad street and the Delaware river. Recent extensions have carried the system north to Lehigh avenue. The telephones are so arranged that conversation can be carried on between any instruments and the Central Fire Alarm Exchange in Room 626, City Hall. By means of this system, the Fire Chief can always give directions to the pumping stations or to the engine houses without going very far to reach a telephone, and without going through any exchanges except the one at City Hall.

At the beginning of the year there were 78 instruments installed on the streets and 140 more had been made up according to a special design of the Bureau, but had not been installed.

Twenty of this design had been installed, and gave so much trouble that it became a serious question if they could be used at all.

By carefully studying the problem and rearranging the different parts, a fairly satisfactory instrument was produced, and 58 of them have been installed and are working satisfactorily, so that the total number of the system has been increased during the year from 78 to 136.

High Pressure Telephone Boxes Installed.

Front and Master streets.
Front and Oxford streets.
Front street and Susquehanna avenue.
Front and Berks streets.
Germantown and Lehigh avenues.
Twelfth street and Lehigh avenue.

Front and Somerset streets.
 Front street and Indiana avenue.
 Front street and Allegheny avenue.
 Front street and Columbia avenue.
 Front and Norris streets.
 Front street and Girard avenue.
 Front and Palmer streets.
 Front and Dauphin streets.
 A street and Lehigh avenue.
 Germantown and Susquehanna avenues.
 Eighth street and Susquehanna avenue.
 Germantown and Montgomery avenues.
 Fifth street and Columbia avenue.
 Sixth street and Columbia avenue.
 Ninth street and Girard avenue.
 Front and Diamond streets.
 Third street and Columbia avenue.
 Second street and Girard avenue.
 Cadwallader and Berks streets.
 Orianna and Berks streets.
 Third street and Susquehanna avenue.
 Phillips street and Susquehanna avenue.
 Randolph and Oxford streets.
 Germantown avenue and Oxford street.
 Second and Oxford streets.
 Columbia avenue, east of Hancock street.
 American and Diamond streets.
 Bodine and Dauphin streets.
 American and York streets.
 Broad street and Columbia avenue.
 Second and Norris streets.
 Third and Somerset streets.
 Third and Huntingdon streets.
 Fourth street and Montgomery avenue.
 Fourth street and Girard avenue.
 Kensington avenue and Huntingdon street.
 Kensington avenue and Cumberland street.
 Howard and Berks streets.
 Fourth street and Girard avenue.
 Third street and Girard avenue.
 Fifth street and Girard avenue.
 Broad street and Susquehanna avenue.
 Coral and Adams streets.
 Emerald and York streets.
 Jasper and Adams streets.

Girard avenue, west of Norris street.
 Front of No. 2407 East Norris street.
 Richmond and Norris streets.
 Susquehanna avenue and Norris street.
 Girard and Susquehanna avenues.
 Girard avenue and Norris street.
 Richmond and Palmer streets.

*Streets on Which High Pressure Telephone Service is
 Installed.*

*High Pressure Telephone Station, No. 1, Delaware Avenue and Race
 Street.*

Arch street, between Broad to Delaware river.
 Chestnut street, from Broad street to Delaware river.
 Market street, from Broad street to Delaware river.
 Race street, from Broad street to Delaware river.
 Walnut street, from Broad street to Delaware river.

*High Pressure Telephone Station No. 2, Seventh Street and Lehigh
 Avenue.*

Broad street, from Girard avenue to Susquehanna avenue.
 Columbia avenue, from Sixth to Front streets.
 Dauphin street, from Bodine to Front streets.
 Fourth street, from Columbia avenue to Montgomery avenue.
 Germantown avenue, from Susquehanna avenue to Oxford street.
 Girard avenue, from Norris street to Susquehanna avenue.
 Girard avenue, from Broad to Front streets.
 Lehigh avenue, from Twelfth street to A street.
 Oxford street, from Randolph street to Germantown avenue.
 Richmond street, from Norris to Palmer streets.
 Third street, from Huntingdon to Somerset streets.
 Susquehanna avenue, from Cedar to Norris streets.
 Susquehanna avenue, from Eighth street to Front street.
 Second street, from Girard avenue to Lehigh avenue.
 York street, from American to Front streets.
 Berks street, from Cadwallader to Front streets.
 Emerald street, from Front to Adams streets.
 Front street, from Allegheny avenue to Girard avenue.
 Girard avenue, from Broad street to Front street.
 Jasper street, from York to Coral streets.
 Jefferson street, from Second to Mascher streets.
 Kensington avenue, from Front street to Huntingdon street.

OVERHEAD ELECTRICAL CONSTRUCTION IN STREETS.

This work is of three kinds: Repair of existing lines, requiring the replacement of one or more poles and some wires; new construction, involving the building of a line to new territory; running temporary lines to take care of reconstruction work of streets, bridges or railroads. A good example of this last case is the work done in connection with the change of grade of the Richmond branch of the Philadelphia and Reading Railway, which required:

4,000 feet 25 pr. cable.

4,100 feet 15 pr. cable.

6 guys.

5 40-foot poles.

The overhead lines are made up of wires belonging to the telephone system, police patrol signal system and fire alarm system. They are run partially on poles belonging to the City and partially upon cross-arms belonging to the City, mounted on poles belonging to public service corporations. The following table gives a summary of the work done:

Summary of Overhead Construction Work.

| | Fire and Police Patrol Exten- sion. | Fire and Police Patrol Repairs. | Exten- sion of Tele- phone. |
|--|---|--|--------------------------------------|
| Arms, six-pin cross..... | 449 | 1,305 | 13 |
| Footwalks cemented | — | 89 | — |
| Footwalks repaved | — | 71 | — |
| Guys put on..... | 12 | 119 | 2 |
| Poles abandoned | — | 277 | — |
| Poles erected, additional..... | 12 | — | 11 |
| Poles hauled | 7 | 94 | — |
| Poles moved | — | 7 | — |
| Poles renewed, 40 feet..... | — | 33 | — |
| Poles renewed, 45 feet..... | 3 | 42 | — |
| Poles renewed, 50 feet..... | 3 | 10 | — |
| Poles renewed, 55 feet..... | — | 2 | — |
| Poles renewed, 60 feet..... | — | 2 | — |
| Poles reset | — | 146 | — |
| Poles shaved | 10 | 50 | — |
| Poles taken down (old)..... | — | 71 | — |
| Trees trimmed | — | 349 | — |
| | Miles. | Miles. | Miles. |
| Wire installed, No. 10 H. D. W. P. | 49.5 | 45.1 | .87 |
| Wire installed, No. 12 F. and W. P. | 1.36 | 1.67 | — |
| Wire installed, No. 14 twisted pr. | .9 | .4 | .2 |
| Wire installed, No. 8 iron wire..... | 1.48 | 5.85 | — |
| Wire taken down..... | — | 66½ | — |
| Wire slack cut out..... | — | 142½ | — |
| Wire transferred | — | 146½ | — |

Total Number of Poles on City Streets.

| | Decem- ber 31, 1908. | Decem- ber 31, 1909. | Decem- ber 31, 1910. | Decem- ber 31, 1911. | Decem- ber 31, 1912. |
|--|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|
| City of Philadelphia..... | 6,197 | 6,015 | 5,839 | 4,487 | 4,162 |
| American District Telegraph Company.. | 1 | — | — | — | — |
| American Telephone and Telegraph Company | 96 | 97 | 97 | 97 | 97 |
| Atlantic Refining Company..... | 5 | 5 | 5 | 5 | — |
| Atlantic and Pacific Telegraph Company | 267 | 267 | — | — | — |
| Bell Telephone Company..... | 5,743 | 5,952 | 6,071 | 5,990 | 5,608 |
| Harrison Brothers & Company..... | 44 | 44 | 44 | 44 | — |
| Holmesburg, Tacony and Frankford Railway Company | 890 | 891 | 891 | 891 | 891 |
| Kensington Electric Company..... | 65 | — | — | — | — |
| Keystone Telephone Company..... | 2,577 | 2,596 | 2,655 | 2,786 | 2,942 |
| Mutual Union Telegraph Company..... | 382 | 323 | — | — | — |
| Pennsylvania Railroad Company..... | 84 | 89 | 88 | 89 | 86 |
| Philadelphia, Reading and Pottsville Telegraph Company | 59 | 56 | 56 | 43 | 29 |
| Philadelphia Electric Company..... | 24,037 | 25,758 | 27,492 | 29,108 | 34,742 |
| Philadelphia Local Telegraph Company. | 121 | 176 | 92 | 63 | 47 |
| Philadelphia Rapid Transit Company.. | 30,629 | 30,336 | 30,404 | 30,674 | 30,720 |
| Postal Telegraph Cable Company..... | 219 | 220 | 220 | 219 | 219 |
| Roxborough, Chestnut Hill and Norris- town Railway Company..... | 637 | 637 | 637 | 637 | 274 |
| Southwestern Street Railway Company. | 653 | 653 | 652 | 653 | 653 |
| United Gas Improvement Company..... | 19 | 19 | 19 | 19 | — |
| Western Union Telegraph Company..... | 852 | 776 | 1,991 | 1,917 | 1,839 |
| Totals..... | 73,217 | 74,850 | 77,253 | 77,722 | 82,279 |





Defacement of Streets by Signs.



Overhead Wires—Lancaster Avenue.



The overhead construction work belonging to the City needs a great deal of money spent upon it. If the total number of poles is approximately 4,000 and the average life of a pole is practically 12 years, it is clear that there must be an annual renewal of nearly 400 poles in order to keep the lines in a safe condition. The actual number of renewals made during the past few years falls far short of this number, as will be seen by the following figures:

Poles Reset or Replaced by New.

| 1908. | 1909. | 1910. | 1911. | 1912. |
|-------|-------|-------|-------|-------|
| 207 | 160 | 50 | 162 | 235 |

This condition was pointed out in May and again in mid-summer, but no appropriations were applicable to such work. Transfers of appropriations for this work were requested September 19 and granted in the middle of November, so that practically nothing could be done during the year 1912. An additional construction gang has been added and sufficient poles purchased to keep the force employed for about three months, after which time either additional appropriations will have to be obtained or poles left in their present dangerous condition.

In addition to the work of construction and maintaining these lines, the Bureau exercises supervision over the lines of the various public service corporations.

Total Number of Miles of Overhead Wires on City Streets.

| | Decem- ber 31, 1908. | Decem- ber 31, 1909. | Decem- ber 31, 1910. | Decem- ber 31, 1911. | Decem- ber 31, 1912. |
|--|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|
| City of Philadelphia..... | 1,827 | 1,827 | 1,867 | 1,866 | 1,854 |
| American District Telegraph Company.. | 264½ | 261½ | 176¾ | 161½ | 152 |
| American Telephone and Telegraph Company..... | 493½ | 461 | 446½ | 446½ | 416 |
| Atlantic Refining Company..... | 15 | 15 | 15 | 10½ | — |
| Atlantic and Pacific Telegraph Company | 120¾ | 133½ | — | — | — |
| Auxiliary Fire Alarm Company..... | — | — | 2½ | 2¾ | 4 |
| Bell Telephone Company..... | 9,507 | 8,293 | 8,064 | 7,607 | 7,020 |
| Girard Point Storage Company..... | 5 | 5 | 5 | 5 | 5 |
| Harrison Brothers & Company..... | 4½ | 5 | 4½ | 4½ | — |
| Holmesburg, Tacony and Frankford Railway Company..... | 50½ | 50½ | 50½ | 50½ | 51 |
| Holmes Electric Protection Company.... | 23¾ | 25¾ | 25¾ | 27½ | 30 |
| Kensington Electric Company..... | 43¾ | — | — | — | — |
| Keystone Telephone Company..... | 808¼ | 900¼ | 935½ | 904 | 941 |
| Mutual Union Telegraph Company..... | 417½ | 365½ | — | — | — |
| National Transit Company..... | — | — | — | 4½ | — |
| New York News Bureau..... | — | — | 114½ | 106½ | 108 |
| Pennsylvania Railroad Company..... | 54 | 49½ | 48½ | 45½ | 46 |
| Philadelphia Railways Company..... | — | — | — | 25¼ | — |
| Philadelphia, Reading and Pottsville Telegraph Company..... | 8¾ | 8¾ | 8¾ | 8¾ | 9 |
| Philadelphia Electric Company..... | 3,601½ | 3,965 | 4,564¾ | 4,892¾ | 4,984 |
| Philadelphia Local Telegraph Company.. | 90¾ | 206½ | 257¼ | 268¼ | 280 |
| Philadelphia Rapid Transit Company.... | 638¾ | 637½ | 638¾ | 651½ | 651 |
| Pneumatic Fire Alarm Company..... | 21 | 21½ | 21½ | 21½ | 20 |
| Postal Telegraph Cable Company..... | 330¾ | 338 | 336¾ | 336½ | 380 |
| Roxborough, Chestnut Hill and Norris- town Railway Company..... | 50¾ | 49¼ | 49¼ | 50½ | 51 |
| Southwestern Street Railways Company | 25¾ | 25¾ | 25¾ | — | 27 |
| United Gas Improvement Company..... | 26¾ | 20¾ | 19 | 14½ | — |
| Western Union Telegraph Company..... | 1,052¼ | 1,260 | 1,874½ | 1,825¼ | 1,819 |
| Totals..... | 19,479 | 18,913 | 19,550 | 19,338 | 18,878 |



The Defacement of Streets by Overhead Wires.

44

The four largest users of the City streets are the Bell Telephone Company, Keystone Telephone Company, Philadelphia Rapid Transit Company and the Philadelphia Electric Company. The tables show that the general tendency of the Bell Telephone Company is to diminish its overhead construction lines and to increase its underground circuits. The tendency of the Keystone Telephone Company and the Philadelphia Rapid Transit Company has been to maintain the amount of overhead construction fairly steady, while the underground circuits increased. The first three companies have not in the past few years added materially to the number of their poles or overhead wires. The Philadelphia Electric Company adds on the average 2,000 poles per year, with a corresponding increase in its mileage of overhead wires.

Underground Electrical Construction and Arc Light Poles Owned by the City.

The work consists of installing and repairing the underground ducts, manholes and cables pertaining to the fire alarm, police and municipal telephone systems, and the cables and some 900 poles belonging to the City used for arc lighting on the following streets:

Market street, north side, west from Market Street bridge to Powelton avenue, including four lights on Market Street bridge.

Walnut Street bridge.

Broad street, east and west sides, south from Spruce street to Oregon avenue.

Locust street, Seventh to Fifteenth streets.

Christian street, north side, Front to Sutherland avenue.

Federal street, south side, from Front street to Twenty-eighth street.

Broad street, north of Girard avenue, east side of Lehigh avenue, west side to Susquehanna avenue, and west side north of Lehigh avenue.

Lehigh avenue, north side from Park avenue to Germantown avenue, south side to Kensington avenue.

Diamond street, Broad street to Thirty-third street.

Columbia avenue, south side, Carlisle street to Ridge avenue.
 Ridge avenue, east side, Vine street to Columbia avenue.
 Fairmount avenue, south side, Broad street to Twenty-sixth street.
 Wallace street, south side, Broad street to Twenty-sixth street.
 Mount Vernon street, north side, Broad street to Twenty-third street.
 Green street, south side, Broad street to Twenty-sixth street.
 Spring Garden street, south side west from Twelfth street to Twenty-sixth street.
 Arch street, four lights, west of Twenty-first street.

The extent of the work depends upon the troubles upon the lines and upon the amount of new work, which in turn depends upon appropriations. As only necessary repair work is done in the winter season, the size of the working force is variable, although the work is planned so as to keep it as uniform as possible. The minimum force consists of four crews, aggregating about 40 men with teams; one crew is used upon the arc light circuit in the City, another upon the trouble work of the fire alarm, telephone and police signal wires, and the other two crews are used partly upon the trouble work and partly upon the new extension work. The elevation of the Reading tracks in the northeast section has caused a large amount of work for these gangs.

The next most important item has been the extension of the high pressure telephone system, the wires for which are all underground. Considerable amount of cable has been installed in pursuance with the policy of the Bureau to replace, as far as possible, its overhead lines by underground circuits. In order to reach that portion of Girard avenue west of Girard avenue bridge, additional conduits have been installed across the bridge and preparations have been made to take down the old and probably dangerous pole line upon Girard avenue.

The following tables give the principal items of maintenance and repair work and new installation:

New Cables Laid.

| Location. | Kind. | Number feet of cable. | Number feet of conduc- tors. |
|--|-----------------------|--------------------------------|--|
| Adams street ----- | 7 pair rubber----- | 2,874 | 40,236 |
| Adams street ----- | 4 conductor ----- | 21 | 84 |
| Adams, east from Kensington----- | 10 pair ----- | 730 | 14,600 |
| Adams, east from Kensington----- | 7 pair ----- | 479 | 6,706 |
| Broad street below Indiana----- | No. 6 ----- | 120 | 120 |
| Broad street, McKean to Oregon----- | 25 pair No. 16----- | 3,600 | 180,000 |
| Emerald, York to Huntingdon----- | 25 pair ----- | 7,710 | 385,500 |
| Richmond, Kirkbride to Bridge----- | | | |
| Bridge, Richmond to Tacony----- | | | |
| Thirty-sixth District Police to west of Broad street----- | | | |
| Eighth National Bank----- | 4 conductor ----- | 203 | 812 |
| Federal street, Twentieth to Twen- ty-eighth----- | 5 pair ----- | 185 | 1,850 |
| Federal street, Twentieth to Twen- ty-eighth----- | 1 pair ----- | 150 | 300 |
| Federal street, Twentieth to Twen- ty-eighth----- | 5 pair ----- | 80 | 800 |
| Fortieth Police District----- | 10 pair ----- | 1,270 | 25,400 |
| Girard avenue ----- | 25 pair ----- | 9,618 | 480,900 |
| Grays Ferry Bridge----- | 300 C. M. rubber----- | 190 | 190 |
| Miscellaneous ----- | 7 pair ----- | 155 | 2,170 |
| Miscellaneous ----- | 5 pair ----- | 150 | 1,500 |
| Miscellaneous ----- | 4 conductor ----- | 98 | 392 |
| Miscellaneous fire boxes----- | 4 conductor ----- | 85 | 340 |
| Miscellaneous high-pressure telephone systems, northeast----- | 7 pair rubber----- | 2,255 | 31,570 |
| Pole, Preston and Haverford----- | 7 pair rubber----- | 165 | 2,310 |
| Pole, Twenty-third and Callowhill----- | 4 conductor ----- | 50 | 200 |
| Pole, Aramingo and Lehigh----- | 5 pair ----- | 194 | 1,940 |
| Pole, Belgrade and Huntingdon----- | | | |
| Pole, Twenty-third and Ellsworth----- | 5 pair ----- | 100 | 1,000 |
| Pole, Forty-fourth and Market----- | 5 pair No. 16----- | 55 | 550 |
| Pole, Germantown and Oxford----- | 7 pair No. 16----- | 75 | 1,050 |
| Pole, Broad and Indiana----- | 7 pair No. 16----- | 90 | 1,260 |

New Cables Laid—Continued.

| Location. | Kind. | Number feet of cable. | Number feet of conduc- tors. |
|---|----------------------|--------------------------------|--|
| Richmond, Lehigh to Allegheny----- | 25 pair No. 16----- | 4,358 | 217,900 |
| Richmond, Allegheny to Madison--- | 25 pair ----- | 416 | 20,800 |
| South Broad Street Boulevard----- | No. 10 ----- | 31,296 | 31,296 |
| South Broad Street Boulevard----- | No. 4 conductor----- | 296 | 1,180 |
| Twenty-fourth District, Richmond and Clearfield----- | 10 pair ----- | 361 | 7,220 |
| Twelfth street, Federal to Water Bureau Shop----- | 10 conductor ----- | 850 | 8,530 |
| Walnut Street Bridge ----- | No. 6 ----- | 140 | 140 |
| Totals----- | ----- | 68,418 | 1,468,816 |

New Conduits Laid.

| Location. | Kind. | Number feet of conduits. | Number feet. duct |
|--|--------------------------|--------------------------|-------------------|
| Adams street | 3-inch pump | 1,556 | 1,556 |
| Adams street | 2-inch galvanized | 191 | 191 |
| Adams street | 2½-inch galvanized | 113 | 113 |
| Adams street | 2½-inch wood | 54 | 54 |
| Adams, east of Kensington avenue. | 3-inch pump | 1,000 | 1,000 |
| Aramingo and Lehigh..... | Galvanized | 150 | 150 |
| Belgrade and Huntingdon..... | | | |
| Broad street, below Indiana avenue | 3-inch pump | 17 | 17 |
| Eighth National Bank..... | 2½-inch galvanized | 50 | 50 |
| Dauphin street | 3-inch pump | 434 | 434 |
| Emerald street, Front to Lehigh.... | 2-inch pipe | 31 | 31 |
| Federal street, between Twentieth and Twenty-eighth..... | 2-inch galvanized | 120 | 120 |
| Federal street, between Twentieth and Twenty-eighth..... | 3-inch pump | 37 | 37 |
| Fifty-fifth and Pine streets..... | 2-inch galvanized | 480 | 480 |
| Fifty-fifth and Pine streets..... | 1½-inch galvanized | 25 | 25 |
| Fifty-fifth and Pine streets..... | 3-inch pump | 150 | 150 |
| Fortieth Police District..... | 2-inch pump | 60 | 60 |
| Fox Park | 3-inch pump | 1,800 | 1,800 |
| Girard Avenue Bridge..... | 3-inch galvanized | 2,470 | 2,470 |
| Girard avenue | 2-inch galvanized | 80 | 80 |
| Girard avenue | 3-inch galvanized | 450 | 450 |
| Grays Ferry Bridge..... | 2½-inch galvanized | 175 | 175 |
| High-pressure House | 3-inch pump | 60 | 60 |
| Lehigh avenue, Amber to Emerald.. | 3-inch pump | 4,800 | 4,800 |
| Lehigh avenue, west of Frankford. | 2½-inch pump | 750 | 750 |
| Miscellaneous fire boxes..... | 2-inch pipe | 105 | 105 |
| Miscellaneous | 2-inch galvanized | 50 | 50 |
| Miscellaneous | 3-inch pump | 25 | 25 |
| Northeast High-pressure Telegraph System | 2-inch pipe | 30 | 30 |
| Pole, Engine No. 19..... | 2-inch pipe | 55 | 55 |
| Preston and Haverford..... | 3-inch pump | 114 | 114 |

New Conduit Laid—Continued.

| Location. | Kind. | Number of feet conduit. | Number duct, feet. |
|--|-------------------------|----------------------------------|--------------------------|
| Preston and Haverford..... | 2-inch galvanized | 40 | 40 |
| Richmond, Lehigh to Allegheny.... | 3-inch pump | 120 | 120 |
| Second Regiment Armory..... | 2-inch pipe | 30 | 30 |
| Sixth and Lehigh avenue..... | 2-inch pipe | 40 | 40 |
| Twenty-fourth District | 3-inch pump | 60 | 60 |
| Twenty-fifth and Callowhill..... | 1-inch galvanized | 30 | 30 |
| Twelfth and Federal to Water Bureau Shop | 2-inch galvanized | 66 | 66 |
| Totals..... | | 15,818 | 15,818 |

Cables Installed for Renewal or Repair.

| Location. | Kind. | Number feet of cable. | Number feet of conduc- tors. |
|--|-------------------------------|--------------------------------|--|
| Arch street, Third to Fourth..... | 21 pair No. 16..... | 457 | 19,194 |
| Arch street, Fourth to Fifth..... | 20 No. 16—11 pair No. 18..... | 440 | 18,480 |
| Arch street, Sixteenth to Seventeenth..... | 20 No. 16—11 pair No. 18..... | 499 | 20,580 |
| Broad street, Westmoreland south..... | 26 pair No. 16..... | 330 | 17,163 |
| Broad street, Cherry to Race..... | 20 pair No. 16..... | 700 | 28,000 |
| Chestnut street, Thirteenth to Juniper..... | 21 pair No. 16..... | 320 | 13,440 |
| Delaware ave. and South street..... | 2 pair No. 16..... | 200 | 800 |
| Federal street, Nineteenth to Twentieth..... | 25 pair..... | 460 | 23,000 |
| Fourth, Girard avenue to Wilkey..... | 20 No. 16—11 pair No. 18..... | 315 | 13,230 |
| Fifty-fifth and Market streets..... | 2 pair No. 16 rubber..... | 75 | 300 |
| Frankford..... | 7 pair No. 16..... | 195 | 2,730 |
| Girard avenue, Third to German-town avenue..... | 21 pair No. 16..... | 275 | 11,550 |
| Market street, Forty-fourth to Forty-fifth street..... | 25 pair No. 16..... | 483 | 24,150 |
| Market street, Twenty-first to Twenty-second street..... | No. 6..... | 475 | 475 |
| Miscellaneous (fire posts)..... | 4 conductor..... | 35 | 140 |
| Miscellaneous..... | No. 6..... | 4,557 | 4,557 |
| Miscellaneous..... | 26 pair..... | 40 | 2,090 |
| Miscellaneous..... | 25 pair..... | 8 | 400 |
| Miscellaneous..... | 7 pair..... | 240 | 3,360 |
| Miscellaneous..... | 5 pair..... | 380 | 3,800 |
| Miscellaneous..... | 4 conductor..... | 155 | 620 |
| Miscellaneous..... | 2 pair..... | 100 | 400 |
| Mast arm leads..... | No. 6..... | 4,870 | 4,870 |
| New Market and Green streets..... | 2 pair No. 16..... | 45 | 180 |
| Pole, Thirty-third and Ridge avenue..... | 7 pair..... | 70 | 980 |
| Ridge and Allegheny avenues..... | 2 pair No. 18..... | 30 | 120 |
| Ridge, Fairmount to Fifteenth street..... | 15 No. 16—5 pair No. 18..... | 408 | 10,200 |
| Second and Wilkey streets..... | No. 6..... | 155 | 155 |
| Second street, below Jefferson..... | No. 6..... | 255 | 255 |

Cables Installed for Renewal or Repair—Continued.

| Location. | Kind. | Number feet of cable. | Number feet of conduc- tors. |
|---|---------------------------|--------------------------------|--|
| State Road, above Robbins..... | 30 No. 16—10 pair No. 18. | 268 | 13,400 |
| Twelfth and Ridge avenue..... | No. 6 | 70 | 70 |
| Twenty-first and Green streets..... | No. 6 | 91 | 94 |
| Twenty-fourth Police District..... | 20 No. 16..... | 235 | 4,700 |
| Twenty-seventh District, pole..... | 7 pair No. 16..... | 200 | 2,830 |
| Woodland avenue, Sixty-first to Sixty-third street | 21 pair No. 16..... | 660 | 27,720 |
| Totals..... | | 18,090 | 273,990 |

*Miscellaneous Work.**High Pressure.*

| | |
|-----------------------------------|----|
| New boxes and posts erected | 56 |
|-----------------------------------|----|

Junction Boxes.

| | |
|-----------------|----|
| Installed | 32 |
| Replaced | 18 |

Mast Arms.

| | |
|----------------|---|
| Replaced | 2 |
|----------------|---|

Manholes.

| | |
|----------------|---|
| Erected | 4 |
| Replaced | 3 |

Poles, Iron.

| | |
|---------------------------|----|
| Taken down | 7 |
| Replaced | 2 |
| Erected | 6 |
| Cleaned and painted | 73 |

Poles Cabled.

Forty-fourth and Market streets.
 Broad street and Indiana avenue.
 Germantown avenue and Oxford street.
 Preston and Haverford avenues.
 Southwest corner Twenty-fifth and Callowhill streets.
 Aramingo and Lehigh avenues.
 Belgrade and Huntingdon streets.
 Engine No. 19.
 Twenty-third and Ellsworth streets.

Signs Erected.

| | |
|--------------------|-----|
| Danger | 149 |
| Street signs | 348 |

Temporary Cable.

(Richmond Branch P. & R. Ry., Elevated.)

(Frankford and Lehigh avenues.)

| <i>Kind.</i> | <i>Feet of Cable.</i> | <i>Feet of Conductor.</i> |
|---------------------|---------------------------|-------------------------------|
| 5 Pr. Rubber | 125 | 1,250 |
| 25 Pr. Aerial | 4,000 | 200,000 |
| 15 Pr. Aerial | 4,100 | 123,000 |

Transferred From Overhead to Underground.

| | |
|--------------------|----|
| Fire boxes | 14 |
| Patrol boxes | 4 |

No attempt has been made to lay conduit for general extension, as the City now owns a large amount which has no cable in it. The policy pursued is to use all the money available for underground work in purchasing and installing cable in existing conduits.

| | 1911. | 1912. |
|---|--------|--------|
| Number of feet of duct installed | 14,245 | 15,818 |
| Number of miles of conductors installed | 84 | 278 |
| Number of high pressure boxes installed | 24 | 58 |

In addition to its own underground work, the City exercises supervision over the underground electrical work of the various public service corporations. The extent of such work and its growth from year to year is shown by the following tables:

Total Number of Feet of Conduit in City Streets.

| | December 31, 1908 | December 31, 1909 | December 31, 1910 | December 31, 1911 | December 31, 1912 |
|---|----------------------|----------------------|----------------------|----------------------|----------------------|
| City of Philadelphia..... | 474,941 | 478,513 | 482,368 | 494,913 | 510,731 |
| American Telegraph and Telephone Company..... | 263,663 | 263,919 | 264,136 | 264,165 | 264,166 |
| Bell Telephone Company..... | 2,395,332 | 2,667,432 | 2,815,020 | 2,939,036 | 3,045,081 |
| Edison Electric Company..... | 101,081 | 101,081 | — | — | — |
| Girard Estate..... | 29,879 | 30,179 | 30,179 | 30,854 | 31,155 |
| Kensington Electric Company..... | 11,079 | — | — | — | — |
| Keystone Telephone Company..... | 1,551,149 | 1,561,578 | 1,563,516 | 1,599,413 | 1,619,017 |
| Pennsylvania Electric Light Company..... | 60,751 | 53,889 | — | — | — |
| Pennsylvania Railroad Company..... | 423 | 423 | 423 | 423 | 423 |
| Philadelphia Electric Company..... | 423,120 | 447,797 | 535,709 | 610,669 | 696,421 |
| Philadelphia Rapid Transit Company..... | 1,258,969 | 1,257,607 | 1,260,119 | 1,262,909 | 1,283,864 |
| Philadelphia, Reading and Pottsville Telegraph Company..... | 1,301 | 1,301 | 1,301 | 1,301 | 1,301 |
| Pneumatic Transit Company..... | 75,239 | 79,320 | 99,185 | 99,185 | 99,185 |
| Totals..... | 6,652,977 | 6,943,069 | 7,031,976 | 7,302,868 | 7,551,344 |

Total Number of Miles of Conductor in City Streets.

| | December 31, 1908 | December 31, 1909 | December 31, 1910 | December 31, 1911 | December 31, 1912 |
|---|----------------------|----------------------|----------------------|----------------------|----------------------|
| City of Philadelphia..... | 4,720 | 4,770 | 5,536 | 5,621 | 5,899 |
| American District Telegraph Company..... | 26½ | 25% | — | — | — |
| American Telegraph and Telephone Company..... | 3,398½ | 3,441 | 3,446% | 4,034% | 4,480 |
| Auxiliary Fire Alarm Company..... | — | — | ½ | ½ | ½ |
| Bell Telephone Company..... | 330,945½ | 336,687 | 348,170 | 361,576 | 381,632 |
| Edison Electric Light Company..... | 190½ | 183½ | 187 | 187 | 187 |
| Girard Estate..... | 16 | 16 | 16 | 16 | 17 |
| Holmes Electric Protection Company..... | 312 | 312 | 325½ | 325% | 325½ |
| Kensington Electric Company..... | 6 | — | — | — | — |
| Keystone Telephone Company..... | 85,460% | 87,580½ | 89,639 | 96,174 | 99,642½ |
| New York News Bureau..... | — | — | 17 | 7½ | 110 |
| Pennsylvania Railroad Company..... | 106½ | 106½ | 123% | 123% | 124 |
| Philadelphia Electric Company..... | 622% | 636% | 748½ | 856% | 978 |
| Philadelphia Rapid Transit Company..... | 1,007½ | 1,025 | 1,026 | 1,036 | 1,029 |
| Philadelphia, Reading and Pottsville Telegraph Company..... | 8½ | 8% | 8% | 8% | 9 |
| Pneumatic Fire Alarm Company..... | 15½ | 21 | 21 | 21 | 22 |
| Postal Telegraph Company..... | 491 | 501 | 501 | 632% | 663 |
| Western Union Telegraph Company..... | 2,679 | 2,717½ | 2,717½ | 3,019 | 3,027 |
| Totals..... | 430,006 | 438,056 | 452,483 | 473,639 | 496,144 |

Betterments and Improvements Recommended.

That the lot belonging to the City at Twentieth and Margie streets be transferred from the Bureau of City Property to the Electrical Bureau, and an appropriation of \$25,000 be made to permit the erection of a suitable storehouse for the overhead and underground work of the Electrical Bureau. At present two storehouses are used, requiring an extra storekeeper, laborer and hauling from railroads, and we are obliged to borrow or rent lots on which to store poles on hand. The savings accomplished by such a storehouse would pay for it inside of five years.

That the erection of street signs be transferred from the Electrical Bureau, which has no special connection with such work.

That a serious effort be made to provide funds, from time to time, which would allow the Bureau to make the improvements and extensions that should have been made long since. Request has repeatedly been made for \$500,000, this amount representing approximately the extent to which the Bureau's equipment has fallen behind. Realizing that such an amount is out of question at the present time, an extra appropriation of \$300,000 for improvement and extensions is recommended for the following:

| | |
|---|------------------|
| New pole lines | \$40,000 |
| Fire alarm system | 145,000 |
| Police patrol signal system | 30,000 |
| Police stations, electrical equipment | 30,000 |
| City's arc light poles and cables | 20,000 |
| City Hall lighting and signals | 20,000 |
| Police and fire stations, electric wiring | 15,000 |
| Total | \$300,000 |

The importance of providing these funds cannot be urged too strongly. The ordinary appropriations scarcely

suffice, even with the economies already effected, to carry on the operation and maintenance work of the Bureau. Consequently, it is impossible to keep up with the extension demanded by the rapid growth and development of the City.

Very respectfully,

CLAYTON W. PIKE,

Chief of the Electrical Bureau.

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|---|----|

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